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A LETTER TO MEDICAL MEN.

Dear Sir:

Of all the discouraging cases which confront the general practitioner there are few more hopeless than chronic nasal and aural troubles. The difficulty of treating discharges from the ears is increased by uncertainty as to their etiology, the only fact that can safely be postulated regarding them being that they are the result of a mixed infection. For example, a bacteriological report recently obtained with reference to an ear discharge is as follows: "Films prepared direct from this swabbing contain many gram-negative and gram-positive bacilli, together with several gram-positive micrococci. The inoculated media yield cultures showing large numbers of bacillus proteus, small numbers of diphtheroid bacilli, and a few micrococci."

Mixed Infections.

A considerable volume of evidence has been accumulated showing that Phylacogen, without operation or local treatment, not only frees the sufferer from excessive secretion, but also, even when the secretion is merely reduced in quantity, entirely gets rid of its unpleasant odor.

We have the records of a large number of cases treated with Mixed Infection Phylacogen.

Two cases are supplied by a surgeon. In both, the discharge became abundant and offensive after operation. Treatment was commenced with 1 Cc. Mixed Infection Phylacogen, the injection being gradually increased until a dose of 8 Cc. was reached. The reactions in both cases were of a comparatively mild character, and the result has been entirely satisfactory.

Suppurating Antrum.

Another case is that of a professional man (43) who has suffered from a chronic nasal catarrh for some nine years, and deafness in the left ear for about a year, with difficulty in breathing through the left nostril. This gentleman does much public speaking, and in the frequent effort to clear his throat he often became quite hoarse. He received in all eight injections of Mixed Infection Phylacogen, doses up to 10 Cc. being given. The reactions after the third, fourth and fifth doses were very severe, but the later doses did not cause much disturbance. He gradually lost his catarrh, and hearing returned at the middle of the course. The result has been most satisfactory, especially as regards the improved condition of his voice and throat in public speaking.

Catarrh with Deafness.

Another case is that of a housemaid (26), who when five years old had an attack of scarlet fever. Ever since then she has had discharge from the right ear, with almost complete deafness; could only hear a watch pressed close on the ear. Treatment was commenced on April 27, 1913, with injection of 2 Cc. Mixed Infection Phylacogen, doses being gradually increased to 10 Cc. After two or three injections the discharge increased in quantity, and became thinner, and thereafter gradually diminished. After eleven injections, extending over three weeks, the patient with her left ear on the pillow heard with the right ear for the first time in twenty-one years the clock ticking in her bedroom. Since then hearing in the right ear is almost as good as in the left.

Suppurative Otitis Media.

One of the medical men from whose reports we have quoted concludes with the following remark: "In my opinion the most remarkable thing about these cases—even more remarkable than the cure of the catarrhs—is the great improvement in the general health which followed in the three to four months after the injections had been discontinued." This opinion is shared by every medical man with whom we have come in contact who has given Phylacogen a fair trial in suitable cases. Our recently issued pamphlets on "Phylacogen Therapy," 1914 edition, contain much interesting material on the new system of treatment, and we shall be glad to send them to you on request.

General Health Improved.

Very truly yours,

Detroit, Mich. PARKE, DAVIS & CO.

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THE NECESSITY OF CONSERVING THE INTERCOSTAL NERVES IN ABDOMINAL INCISIONS—AN EXPERIMENTAL STUDY.*

E. P. QUAIN, M.D.,
BISMARCK, N. D.

The longitudinal incision through the rectus muscle is of comparatively recent development in the various methods of opening the abdomen. It is used not only for the purpose of making a more liberal opening into the abdomen in certain conditions, but also to permit the closure to be made in layers and by imbrication. The earlier longitudinal incision through the linea alba had several objectionable features. The most important of these were, the high degree of traction necessary to overcome the bilateral pull of the transversalis and internal oblique muscles and the difficulty of obtaining solid union between the two edges of a single fascia. The incision was then made more and more lateral from the linea alba, until at present a great number of surgeons, both here and abroad, by preference make a liberal longitudinal incision through the rectus muscle at, or even external to, the central line of the muscle. This incision gives, especially in the upper abdomen, two firm fasciæ for closure, with the additional muscle cushion between them.

The incision is conservative with respect to the rectus muscle itself and perhaps to the deep epigastric and internal mammary vessels under the muscle, but it cuts transversely through all other important structures of the abdominal wall. These structures are chiefly, the fibers composing the fasciæ, and the intercostal nerves. The severed fasciæ can be made to reunite and the permanent damage to them may not be great, but the destruction of the nerves causes an enervation of practically all the tissues which lie in the space between the incision and the linea alba. That this enervation frequently results in a weakening of the supporting tissues and subsequent herniae has been known for a long time. But what about the other structures involved? What about the peritoneum?

From time to time I have had occasion to operate on patients who had previously been operated upon through lateral abdominal incisions placed in such a way as to sever intercostal nerves. The findings in such cases have suggested a possibility that the omentum may have a greater tendency to adhere permanently to that part of the abdominal wall which has been deprived of intercostal nerve supply than to any other part of the parietal peritoneum. The omentum is ever ready to adhere to damaged tissues, and it would not be strange if it had this tendency also with respect to enervated peritoneum.

To illustrate some of the observations referred to: A woman of 40 was operated upon for acute appendicitis. Misjudging the location of the appendix, the gridiron incision was made much too high. The tip of the appendix was found to be imbedded in the pelvis among loops of small intestines. The incision was then extended downward outside the semilunar line to a point near the groin. Naturally all nerve-fibers within the bisected zone were destroyed. There were no adhesions to the abdominal wall except at a point near the groin. Moist pads were used to wall off the infected region, and the appendicectomy was done without unusual mauling of the parietal peritoneum. The upper part of the wound was sutured and a drainage tube was inserted at the lower end of the incision. The wound discharged a small amount of pus during the following week but it was healed completely in three weeks. A year later this patient was operated upon again for post-operative hernia. At this time the omentum was found to be firmly adherent to the whole area of parietal peritoneum, lying between the incision and the linea alba. Similar post-operative adhesion formation has been seen in a few instances following a longitudinal incision over the gall-bladder. The omentum has been found attached internally from the line of incision, while on the external side the peritoneum appeared normal. It would seem that instrumentation and possible bile infection during the operation would have injured the peritoneum about equally on both sides of the incision.

A series of experiments on animals has been conducted by the writer, in an endeavor to learn whether or not the destruction of the intercostal nerves supplying the peritoneum would result in

*Read before the Western Surgical Association, St. Louis, December 20, 1913.

any anatomical changes in the peritoneum, with special reference to adhesion formation.

The plan adopted was as follows:

GROUP I. Under aseptic conditions, to make an incision near the costal margin on one side and sever the last 3 or 4 intercostal nerves (the 12th, or subcostal, is included under the term "intercostal" throughout this paper); after some time, to explore the abdomen and learn whether the destruction of the nerves alone caused any changes in the peritoneum supplied by these nerves.

GROUP II. To open the abdomen through the linea alba, in a number of animals, the incision to be placed in the lower part of the epigastrium so that the peritoneum supplied by the last four intercostal nerves could be easily reached; to traumatize the parietal peritoneum on each side of the incision and to exercise the greatest care that the degree of injury inflicted should be as nearly alike on the two sides as possible; to close this incision; and lastly to make a second lateral incision and sever the lower intercostal nerves on one side.

GROUP III. To perform the same operations, traumatize the peritoneum and cut off the nerve supply on one side, and to add an irritant or a mild infection to the peritoneum, and in the same dosage to each side of the abdomen.

The trauma was inflicted by rubbing the peritoneum on both sides with fingers or forceps wrapped in a definite amount of gauze; by rubbing the same number of times and in the same direction on each side; and by using as nearly as possible the same amount of force to each side.

The irritant used was a weakened tincture of iodine. The infection was a solution of gastric or intestinal contents obtained from the same animal on which it was used. It was assumed that an autogenous infection of bacteria would be more easily overcome by the animal than foreign bacteria, which might originate an uncontrollable peritonitis.

All these means and methods are fairly accurate and easy of application, except the necessity of applying an exactly equal amount and kind of force to each side in making the trauma. This must depend on the judgment and experience of the operator, and cannot be mathematically accurate. However, I believe it possible to exercise sufficient care in bruising the peritoneum by hand to make the margin of error almost negligible. In a series, this margin of error would probably break even for both sides.

Three experiments were made in Group I, extirpation of intercostal nerves without disturbing the peritoneum. In Group II, 8 animals, 5 dogs and 3 rabbits, were used. An incision was made in the linea alba, the peritoneum was rubbed equally on both sides, the wound closed, and then the lower intercostal nerves were excised on one side through a second incision. In Group III, 7 experiments were made. The peritoneum was rubbed on both sides through a median line incision, then tincture of iodine was applied in two animals, gastric contents in two, and intestinal contents in three. After closing the median line incision, segments from the 10th, 11th and 12th intercostal nerves were removed near the costal margin on one side. It might be added that the solutions used, both of iodine and of gastric and intestinal contents were very weak.

REPORT OF OPERATIONS AND EXPERIMENTS.

GROUP I.

Dog No. 1.

Operation, February 8, 1912. Under strict aseptic precautions an incision was made along the left costal margin from the epigastrium to a point near the crest of the ilium. The incision extended through the muscles and to the fascia transversalis. The last five intercostal nerves and the ilio-hypogastric were dissected out and a segment of each extirpated. The wound was closed.

February 19, 1912, an exploration was made through a median line incision in the epigastrium of the same dog. There were no adhesions to the parietal peritoneum anywhere. The peritoneum appeared normal. The wound was closed in layers, the peritoneum being touched only to suture the edges together.

Another incision was then made along the right costal margin through the muscles and through the fascia transversalis. The last five intercostal nerves were dissected out and a section removed from each. The wound was closed. All wounds healed without suppuration.

March 6, 1912, the abdomen was reopened for examination. The omentum was found slightly adherent over the middle third of the peritoneal suture line in the epigastrium. The peritoneum on both sides had a normal glossy and transparent appearance.

Dog No. 2.

Operation, April 29, 1912. An intestinal resection was made on this dog through a median line incision at the umbilicus. The loop of bowel was lifted out of the abdomen and surrounded with moist gauze during the operation. The parietal peritoneum was not touched with gauze. The wound was carefully closed in layers.

A second incision was then made across the lower ribs on the right side, 3 cm. from the costal margin

and segments from the 10th, 11th, and 12th intercostal nerves extirpated.

Autopsy, May 20. There were no adhesions to the parietal peritoneum.

GROUP II.

Dog No. 3.

Operation, March 11, 1912. A 10 cm. incision was made in the linea alba with the center of the incision at the umbilicus. The parietal peritoneum was rubbed with two fingers wrapped with four layers of gauze. The fingers rubbed rather gently forward and back twice on each side, care being taken to reach a point equidistant from the incision on each side, and as far as possible to apply an equal amount of force on each side. The wound was closed in layers.

A second incision was then made along the right costal margin and the five lower intercostal nerves severed and partly extirpated.

Abdomen reopened May 24, 1912 (74 days after operation). The omentum was found adherent along the greater part of the suture line, the adhesions extending 2 cm. to the left and 4 cm. to the right of the linea alba.

Dog No. 4.

Operation, May 30, 1912. Median line incision 8 cm. long was made in the epigastrium. The parietal peritoneum was rubbed once forward and back on each side as far as the fingers could reach. The index and middle fingers were used, wrapped with four layers of gauze, fresh gauze being used on each side and care being exercised to apply an equal amount of pressure on both sides. The wound was closed.

A second incision was made along the left costal margin. The 9th to the 12th intercostal nerves, inclusive, and also the ilio-hypogastric were severed in the bottom of the incision; the vessels were ligated and the wound closed.

Autopsy, June 10, 1912 (11 days after operation). The omentum was adherent to the anterior parietal peritoneum over a triangular surface. The base of the triangle corresponded to the suture line under the linea alba and the apex to a point 5 cm. to the left of the incision. The triangle of adhesions lay entirely to the left of the incision. The adhesions were very firm; traction tearing the omentum did not losen the adhesions. The peritoneum appeared thickened on the operated side.

Dog No. 5.

Operation, April 28, 1913. An 8 cm. incision was made through the linea alba, the umbilicus at the middle of the incision; parietal peritoneum was rubbed twice forward and back with two fingers wrapped in four layers of gauze; fresh gauze was used for each side and the same amount of pressure; wound closed carefully in layers.

Second incision made at right costal margin; the last four intercostal nerves were carefully dissected out through slits in the transversalis muscle and the segments excised; neither intercostal vessels nor transversalis muscle fibers were severed.

Autopsy, May 13, 1913 (15 days after operation). There was a firm omental adhesion along the scar in the linea alba. The adhesion was practically confined to the right side of the incision and covered roughly a rectangular area 4 x 6 cm. in extent.

Dog No. 6.

Operation, April 28, 1913. Median line incision 8 cm. long through the umbilicus; parietal peritoneum rubbed on each side with two fingers wrapped in three layers of gauze; three strokes (1½ excursion) were made with gentle and equal pressure on each side; wound closed with catgut in peritoneum and silk in fascia.

A second incision was made over the left costal margin and the 9th to the 12th intercostal nerves, inclusive, were destroyed. Wound closed.

Autopsy, May 13, 1913 (15 days after operation). Omentum was feebly adherent over an area 5 x 5 cm. at the lower end of the incision. The adhesions extended an equal distance on each side of the incision.

Dog No. 7.

Operation, May 1, 1913. Median line incision from 5 cm. above to 3 cm. below the umbilicus. Four layers of gauze were wound around 2 fingers which were introduced towards the lumbar region, pressed firmly against the abdominal wall and then withdrawn, causing a rubbing toward the incision. This was repeated 3 times on each side, each zone of rubbing being a little higher than the previous. Fresh gauze was used for each side. The abdominal wound was carefully closed with interrupted silk sutures in each fascial layer.

A second incision was made across the ribs midway between the costal margin and the vertebral column on the right side. The last four intercostal nerves were dissected out between and below the ribs, and the segments removed. The intercostal vessels were not wounded. The wound was closed.

Autopsy, May 17, 1913 (16 days after operation). Omental adhesion along whole length of incision; adhesion 2 cm. wide and attached entirely to the right of the line of incision. Peritoneum thickened on the operated side.

Rabbit No. 1.

Operation, April 30, 1913. Incision through linea alba in epigastrium; peritoneum on both sides rubbed hard once forward and back with one finger covered with gauze; wound closed; three lowest intercostal nerves on left side excised through incision across ribs behind costal margin.

Autopsy, May 12, 1913 (12 days after operation), rabbit (female), found dead; had been pregnant and miscarried after the operation; right uterus found empty; left uterus contained unexpelled rabbits, and placentæ, but the placentæ were detached. No visceral adhesions to abdominal wall; but on left side of linea alba was a transverse line of fibrin deposit adherent to the peritoneum.

Rabbit No. 2.

Operation, April 30, 1913. Midline incision in epigastrium; peritoneum rubbed firmly twice from the lumbar muscles toward the edge of the wound with artery forceps wrapped with gauze; the same on both sides; wound closed. Second incision at left costal cartilages and segments of the last three intercostal nerves extirpated.

Autopsy, May 19, 1913 (19 days after operation). Hernia of abdominal wall on left side; peritoneum roughened and omentum adherent at one point 2 cm. outside semilunar line on left side; adhesion 2 cm. in width.

Rabbit No. 3.

Operation, September 2, 1913. Incision through the linea alba from the center of the epigastrium to a point below umbilicus; parietal peritoneum rubbed equally on both sides with one finger wrapped in two layers of gauze, fresh gauze for each side; wound closed in layers with catgut. Second incision made across costal cartilages on the left side and sections of the last four intercostal nerves extirpated. Wound closed with catgut.

Autopsy, September 16, 1913 (14 days after operation). No adhesions to the parietal peritoneum. Peritoneum appeared normal on the right side, while on the left it was thickened and had a dull grayish white color over the area between the incision and the costal margin.

GROUP III.

Rabbit No. 4.

Operation, April 30, 1913. A median line incision, 5 cm. long, was made in the upper abdomen. One finger, covered with two layers of gauze, was swept over each side of the abdomen once forward and back. A piece of gauze carrying a few drops of tincture of iodine was touched gently to each side of the bruised peritoneum. Care was exercised that the sides of the abdominal wall should be given equal treatment. Wound closed. Second incision made at the left costal margin and the 10th, 11th and 12th intercostal nerves and vessels severed. The incision severed practically all tissues down to the peritoneum.

The rabbit died three days after the operation. Autopsy showed the colon adherent to the anterior abdominal wall, the adhesions being decidedly more extensive on the left side. Intestine and liver stained with iodine. No adhesions between viscera.

Rabbit No. 5.

Operation, September 2, 1913. Incision through linea alba at the lower part of the epigastrium. Dry gauze was wrapped around a Carmault artery forceps and one hard rub made over the parietal peritoneum on each side; a piece of gauze containing a small amount of tincture of iodine was then touched to each bruised surface. The sides were treated as nearly alike as possible. After the treatment a faint iodine stain could be seen on each peritoneal surface. Wound closed with catgut.

Second incision at left costal margin through most of the muscle fibers down to the peritoneum; the last five intercostal nerves were severed and segments removed; three of the intercostal vessels were saved. Wound closed with catgut.

Autopsy, September 27, 1913 (25 days after operation). Whitened and thickened peritoneum over rubbed area on left side; right side normal. A lobe of the liver was firmly adherent at the central part of the traumatized area on the left side; no other adhesions.

Rabbit No. 6.

Operation, September 16, 1913. Median line incision at the center of the abdomen. Both sides of the parietal peritoneum were rubbed once forward and back and once in a dorso-ventral direction with an artery forceps wrapped in gauze. A small amount of gastric contents was obtained with a hypodermatic syringe and diluted one drop in 4 cc. of sterile water. From this solution 4 drops were run over each side of the bruised peritoneum. Wound closed.

Second incision at the right costal margin where the last 4 intercostal nerves were extirpated and nearly all tissue fibers severed to the peritoneum. Wound closed.

Autopsy, October 28, 1913 (42 days after operation). An adhesion from stomach to linea alba at central part of incision. Peritoneum is whitened on both sides of the middle line to nearly the same degree.

Rabbit No. 7.

Operation, September 16, 1913. Median line in-

cision in epigastrium; with a forceps wrapped in gauze one rub was made over the peritoneum from before backward and another from the lumbar region toward the margin of the wound, on each side. A hypodermatic needle was inserted into the stomach and a few drops of liquid contents obtained. One drop of this was diluted with 4 cc. sterile water and 3 drops from this solution were allowed to trickle over the rubbed peritoneum on each side. Abdominal wound was carefully closed.

Segments were then removed from the 10th, 11th, and 12th intercostal nerves through a second incision at the left costal margin. Wound closed and sealed.

On October 28th (42 days after operation), this rabbit was again opened in the linea alba immediately below the previous operation. There were no adhesions to the abdominal wall anywhere. Condition of peritoneum not noted. Desiring to obtain a stronger infection, a hypodermatic needle was inserted into the colon. In the absence of liquid bowel contents, it was found necessary to inject 5 or 6 cc. of sterile water which was again withdrawn through the needle. A 10% dilution in sterile water was then made from the contents of the syringe. Four minims from this solution was then spread evenly over the peritoneum on each side of the incision. Wound closed.

Autopsy, November 20, 1913 (23 days after second operation). An omental adhesion was found to exist on the left side between the first incision (September 16) through the linea alba and the semilunar line. The adhesion was over 3 cm. wide. (This adhesion was not present at the time of the second operation, October 28th.) The peritoneum on the left side was thickened and whitened from the linea alba to a line corresponding with the left costal margin. The peritoneum on the right side showed no such whitening, but appeared quite normal.

Rabbit No. 8.

Operation, October 28, 1913. An incision was made in the linea alba above the umbilicus, 10 cm. long. With a finger wrapped in four layers of gauze, the peritoneum was rubbed six times from before backward. A solution was then made with a hypodermatic syringe from colon contents in the same manner as in rabbit No. 7. Six drops of this solution were spread evenly over each side of the bruised peritoneum. Wound closed.

The 10th, 11th and 12th, intercostal nerves were then severed along the costal region on the left side. Another nerve, apparently an accessory from the 12th intercostal, was dissected out and excised. All intercostal blood vessels involved were severed and ligated. Wound closed.

Autopsy, November 20, 1913 (23 days after operation). The peritoneum was whitened opposite the median line incision on both sides. The whitening was decidedly more marked on the left side than on the right. There were no adhesions to the line of incision, but on the left side in the center of the whitened area five cm. from the linea alba was a firm omental adhesion two cm. in diameter.

Dog No. 8.

Operation, November 5, 1913. Incision through linea alba at umbilicus 10 cm. long; the peritoneum rubbed on each side four times forward and back with forceps wrapped in gauze; liquid contents obtained from a loop of ileum with needle. This was diluted 1 to 10 in sterile water and three drops of this applied to the rubbed peritoneum on each side. Wound closed. Second incision across lower ribs on right side and 10th, 11th, and 12th intercostal nerves severed five cm. behind costal margin; all intercostal blood vessels intact, hence may not have destroyed all nerve filaments.

Autopsy, November 19, 1913 (14 days after operation). Peritoneum whitened and thickened on both sides opposite abdominal incision, but decidedly more so on the right where it extended beyond the costal margin; on the left it extended but slightly beyond the semilunar line. Omentum adherent to the central portion of the incision. The adhesion extended four cm. toward the right side, while on the left it barely crossed the linea alba.

In looking over the results from the experiments in Group I, we find that the absence of intercostal nerve supply alone, without the addition of trauma, caused no adhesions and no macroscopic changes in the serosa. No sections were made in these cases to compare the two sides microscopically.

In Group II, absence of intercostal nerve supply plus trauma, there is a difference between the two sides of the animals in all cases but one. The difference varies in degree, but it has a constant relation to the side deprived of nerve supply.

The individual resisting or recuperating power which varies so widely in the human, undoubtedly plays a rôle in lower animals also. This resistance depends upon tissues aside from the nerves and may account in some measure for more thorough restitution in one enervated peritoneum than in another.

The rubbing in the first experiments was done with less severity than in the later cases. There was no precedent to follow, and it seemed best to feel the way gradually. The amount of force ap-

plied to the peritoneum was probably not much greater than that exerted by some surgeons while pushing gauze pads roughly into the abdomen, and, after the operation, carelessly jerking the pads out. In the later experiments the rubbing was done a little more energetically, yet in no instance to such a degree that subserous hemorrhages could be seen.

The peritoneum in the rabbit is very thin and delicate and undoubtedly it received a much harder rubbing in proportion to its strength than did the peritoneum of the dogs. As a probable result of this, there was found in the rabbits a more constantly appearing infiltration of the peritoneum than in the dogs. The omentum of the rabbit is very short and does not lend itself to adhesions as readily as that in the dog. In most of the dogs there were omental adhesions along the line of the peritoneal incision in the linea alba. This can be accounted for chiefly by the fact that the edges of the peritoneum were rubbed and handled more roughly than the distant parts. Tincture of iodine was used very freely on the skin and some of this drug, no doubt, added insult to the peritoneal margin. But in all cases where adhesions extended farther from the linea alba on one side than on the other the adhesions favored the enervated side.

Microscopic sections taken from the whitened areas of the peritoneum on the enervated side and compared with similarly situated sections on the normal side showed that the subserosa was much thicker in the former than in the latter. This thickening seemed to be due to a round-cell infiltration and an edema, which was absent on the normal side, two to three weeks after the operation. This tends to show that repair is delayed where the nerve supply has been removed. It proves that nature makes a noble and partly successful effort to repair the damage even in the absence of nerve supply, but that this repair suffers from a lack of that control which makes for rapid and perfect result.

A mild trauma or infection on a healthy peritoneum induces a temporary adhesion which may be released after the healing process of the serosa has been completed and absorption has taken place. These experiments suggest that in the absence of intercostal nerve relations the infiltration becomes more chronic, the healing defective, and therefore a more reluctant release of the adhesions is to be expected.

Very decided results were seen in the two rabbits where iodine was applied to the peritoneum. One died undoubtedly from bowel obstruction due to the adhesions to the parietal peritoneum. The adhesions were much more extensive on the enervated side, though by no means confined to that side. In the other rabbit the whole rubbed area on the operated side was whitened and thickened and a lobe of the liver was adherent in the center of the area. The peritoneum on the other side appeared normal.

The combined injury from the rubbing and the iodine was probably greater than that applied in any other experiment. This suggests that if a higher degree of damage were inflicted on the peritoneum than that used in any of these experiments, the difference in reaction between the normal and the enervated side would be much more striking.

The two experiments with gastric contents were practically negative. The rubbing was made with forceps wrapped in gauze and was applied more gently than in most experiments. The gastric contents of a rabbit probably contain but few bacteria and in the small dose applied to the peritoneum even those few may have been missed, so that no additional reaction was called forth.

The intestinal infection used was very feeble, if indeed present in all cases. Yet in all the three instances where it was applied after rubbing, there were omental adhesions on the operated side and none on the normal side. Of special interest is the case where no adhesions were present after the application of gastric contents but an adhesion formed after colon infection was added.

In the case of a female rabbit having a miscarriage after the operation, it is interesting that the uterus on the side of intercostal nerve extirpation had been unable to empty itself. Whether this was merely a coincidence or whether the nerve destruction on that side had any influence on the uterine contractions, it is impossible to state.

If only the trunks of the intercostal nerves are extirpated at the costal margin or even between the ribs, one cannot be certain that the whole area supplied by these nerves is totally enervated. This may be true even if we overlook the probability that the nervi vasorum have some function beside that of strict vasomotor control. Nerve filaments may come off from the main trunk behind the point where the nerve is severed and pass unharmed in the transversalis fascia in the zones between the nerves. To obviate this possibility, the lateral incision in such experiments should sever all the tissues down to the peritoneum. This is exceedingly difficult to do, without damaging the peritoneum, and it was attempted in only a few of the experiments. It is probable therefore that the enervation was not so complete in any of the experiments as that produced in a laparotomy with a lateral longitudinal incision.

The question of time was not considered in these

experiments. The adhesions as a rule covered only a small part of the rubbed area, and the more recent ones were not very firmly attached. It must be admitted that some of them might have disappeared in course of time; but the majority of the adhesions certainly were too firm to promise any such outcome.

To analyze the results of the fifteen experiments in which trauma, or trauma plus irritation or infection, was applied on the parietal peritoneum: we find that in eight the adhesions (seven omental and one hepatic) were confined to the side of nerve extirpation; two of the three cases having adhesions on both sides of the linea alba had more extensive adhesions on the operated than on the normal side; one case had fibrin deposits which were limited to the enervated side; and one rabbit having no adhesions had a marked infiltration of the peritoneum on the operated side, thus leaving only three animals in which no material difference between the two sides was noted. An ineffectual attempt to infect the peritoneum with gastric contents had been made in two of these three negative experiments.

It can be stated, therefore, that in 80% (12 in 15) of the experiments made to determine whether or not a destruction of intercostal nerves supplying parietal peritoneum is of pathological significance in regard to this peritoneum, the answer was, in greater or less degree, positive.

If further experimentation and observation should sustain the evidence which I have ventured to present, it will tend to discourage the use of every incision which deliberately separates peritoneum from its nerve supply. It will add another strong argument in favor of transverse abdominal incisions.

TABULATION OF EXPERIMENTS AND RESULTS.

Experiment No.	Trauma &c. inflicted to peritoneum each side of linea alba	Intercostal nerves cut	Examination (exploration or autopsy)	Results
GROUP I.				
Dog No. 1.....	Abdomen not opened.....	Left....	11 days after op.	No adhesion, peritoneum normal.
Same dog.....	" " "	Right...	16 " " "	Slight adhesion to incision, peritoneum normal.
Dog No. 2.....	Intestinal Resection..... (no rubbing)	Right...	21 " " "	No adhesion.
GROUP II.				
Dog No. 3.....	Rubbed with gauze.....	Right...	74 " " "	Omental adhesion extending 2 cm. to left and 4 cm. to right from linea alba.
Dog No. 4.....	" " "	Left....	11 " " "	Omental adhesion 5 cm. wide, entirely to left of linea alba. Peritoneum thickened on left side only.
Dog No. 5.....	" " "	Right...	15 " " " " "	4x6 cm. confined to right side.
Dog No. 6.....	" " "	Left....	15 " " " " "	5x5 cm. distributed equally on both sides.
Dog No. 7.....	" " "	Right...	16 " " " " "	2 cm. wide, all on right side. Peritoneum thickened on right side.
Rabbit No. 1...	" " "	Left....	12 " " "	No adhes. Fibrin deposit on left. Incomplete abort in left and complete in rt. uterus.
Rabbit No. 2...	" " "	Left....	19 " " "	Omental adhes. 2 cm. to left of lin. semilun. Hernia on one side.
Rabbit No. 3...	" " "	Left....	14 " " "	No adhes. Peritoneum whitened and thickened on left side.
GROUP III				
Rabbit No. 4...	Gauze rubbing plus Tr. Iod..	Left....	3 " " "	Colon adherent both sides, mostly on left.
Rabbit No. 5...	" " " " " ..	Left....	25 " " "	Liver adherent on left side. Peritoneum thickened on left.
Rabbit No. 6...	Gauze rub plus gastr. cont..	Right...	42 " " "	Stomach adher. to incision. Peritoneum the same on both sides.
Rabbit No. 7...	" " " " " ..	Left....	42 " " "	No adhesions.
Same Rabbit...	Added intestinal contents...	Left....	23 " " "	Omentum adherent and peritoneum thickened on left side.
Rabbit No. 8...	Rubbing plus " " ...	Left....	23 " " "	" " " " thickened on left side.
Dog No. 8.....	" " " " ...	Right...	14 " " "	" " " " thickened on right side.

CONCLUSIONS:

A destruction of the intercostal nerves without trauma to the peritoneum does not cause any macroscopic change in the peritoneum.

A perfect healing of a mildly traumatized peritoneum may occur after the intercostal nerve supply has been severed.

If a weak irritant or infection be added to the trauma, the serosa may still recuperate.

But if a peritoneal surface deprived of its intercostal nerve supply be subjected to a trauma, or to a trauma plus infection or irritation, such as may obtain during an operation, more adhesions and a more chronic infiltration of the peritoneum is likely to follow than if the same injuries were inflicted on a peritoneum with normal nerve supply.

I wish to express my appreciation to Dr. J. F. Corbett, Associate in Surgery at the University of Minnesota, for much valuable help and advice in this work.

COMPOUND LACERATIONS OF JOINTS.

Compound lacerations should have the following treatment:

1. Sterile field by swabbing with tincture iodine.
2. Cleanse bone with instruments, never touching it with sponges, fingers, etc.
3. Reduction with little trauma.
4. The opening closed by accurate approximation of all injured tissues, skin closed without drain. Inject joint with formaldehyde-glycerine solution, immobilize and put up in extension, if hip, knee or elbow or shoulder injuries. If temperature high and tension great, aspirate and inject more formaldehyde solution. If the sutures do not hold and joint thoroughly pussy, treat as an open infection of joint and drain thoroughly.

THE PARALYTIC CONDITIONS OF CHILDREN — TREATMENT FROM THE GENERAL PRACTITIONER'S STANDPOINT.

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The recognition and treatment of the paralytic affections of childhood is of such importance that their reiterations should act as a stimulus to practitioners and specialists alike—the former to be on the alert to detect paralytic phenomena; the latter, to institute proper measures for their treatment.

I shall limit my remarks to the commoner forms of paralysis, as seen at the Hospital for Deformities and Joint Diseases where we have given about sixty thousand treatments in the past seven years to paralyzed children.

(1) *Central Congenital Lesions:* We find that cerebral birth palsies occupy an important place. These are general due to mechanical rupture of meningeal vessels, and secondary invasion of the motor zone by blood clot. The diagnosis of this condition presents no difficulties. There is usually a history of difficult labor. After a very little time, it is noticed that the child's extremities are rigidly adducted. Walking, perhaps, is impossible on account of the adductor spasm. The reflexes are exaggerated, the highest tap producing a violent response. If the later tracts have degenerated, we may find a Babinski reaction and ankle clonus. There is little or no atrophy; the electrical reaction is normal or decreased. Where there is a cortical agenesis or defective cortical development, there may be flaccid paralysis, due to maldevelopment of the lateral tracts. The reflexes in electrical reactions are, as a rule, normal, and moderate atrophy may be present.

(2) *Acquired Cerebral Palsy:* In the acquired type of cerebral palsies, we find hemiplegia the most prominent. These are associated with infectious diseases, cardiac conditions, surgical operations, or they may develop without any definite cause. A large percentage of these cases are syphilitic, no doubt. The history of the case and symptoms make the diagnosis easy. There are exaggerated reflexes, rigidity; normal electric reaction; no atrophy.

(3) *In Encephalitis, Spinal Meningitis with Paraplegia, Hemiplegia, or Monoplegia,* with or without a history of previous illness, we find flaccidity and mild atrophy; reflexes, absent or present; reaction, normal or not.

(4) *The Paralysis Due to Spinal Cord Lesions,* the most important of which are anterior poliomyelitis and compression paraplegias. The diagnosis of anterior poliomyelitis presents little or no difficulties. The history is one of previous well-being with the sudden onset of acute illness followed by a flaccid paralysis, which may affect any or most of the muscles of the body. Atrophy is an early condition in the affected muscles. There is also vasomotor paresis, giving the limb the characteristic blue, cold appearance. Reflexes are lost early, and the reaction of degeneration in the affected muscle completes the picture.

(5) *The Compression Paraplegias* of interest to us are those occurring in Pott's disease. The previous history pointing to the spinal affection and the kyphus would call attention immediately to the cause of the paralysis. There are pains radiating to the abdomen or down the legs, depending upon the location of the lesion; weakness, ataxia; paralysis; exaggerated reflexes; ankle clonus and Babinski phenomenon. In compression of lumbar segments, in addition to paraplegia, there appears involvement of the sphincters. The electrical reactions are normal; there is no atrophy early. Treatment, rest and counterextension.

(6) *Multiple Neuritis:* In paralysis due to peripheral causes, multiple neuritis takes first rank. This is usually a sequel of diphtheria or other infectious diseases. The paralytic phenomena in this condition appear slowly. Sensory symptoms are distinguishing features, and consist of pain, tenderness and hyperesthesia along the course of the nerve trunk. Foot- and wrist-drop finally appear and clinch the diagnosis. Atrophy and the reaction of degeneration appear soon after the paralysis. In a few cases of multiple neuritis of sudden onset with little or no sensory symptoms, the condition may be mistaken for anterior poliomyelitis, and a positive diagnosis between both conditions may be impossible. The course of the disease will finally help us. A history of diphtheria or exposure to the disease naturally counts in favor of multiple neuritis.

(7) *Facial Palsy:* Under facial palsy of Bell's type, I would suggest to the general practitioner to place a bent hairpin with a string attached, in the mouth, and tie the other end of the string tightly to the ear, in order to correct the deformity of the face. The exposure of the eye must be attended to also.

(8) *Traumatic Paralysis:* I come, now, to a form of paralysis of traumatic origin such as Erb's palsy, in which the parent is advised between treatments

to keep the patient's arm in contact with the chest, thumbs up; that is, supination and external rotation. Also in this group are ischemic paralysis, Volkmann's paralysis, occupational paralysis, and the paralysis of surgery, as of mastoid operations, fracture of the humerus, or where scar tissue of other foreign material has prevented the nerve from reuniting. No method of treatment (other than nerve surgery) seems to have any effect on the last mentioned severed nerve variety, with the exception of disruptive high frequency.

(9) *Muscular Dystrophy:* Most important in this group are pseudo-muscular hypertrophy and the muscular atrophies of Aran-Duchenne and Charcot-Tooth-Marie. The characteristics of the hypertrophies are their onset in early childhood and distinct hereditary manifestation. A progressive enlargement of certain muscular structures, notably the thigh and calf, and a corresponding diminution in their motor activity until total helplessness supervene, are the diagnostic features. The reflexes are retained and the electrical reactions are diminished but never lost.

In the muscular atrophies, the onset of gradual wasting in early childhood of either the hands or legs, distinguish this type of disease. The reflexes disappear when atrophy is well advanced and the reaction of degeneration is present in the affected muscles.

In a brief article of this kind only some general ideas can be given with regard to treatment. Should a brace be deemed necessary to prevent deformity, or for some other equally good reasons, it should be taken off daily for normal use of the limb, and must be removed when it has served the purpose for which it was originally applied. Before applying the brace, some tenotomies may have to be done to place parts in functionating position.

If the range of motion is limited, perhaps a tenotomy is indicated or stretching of the shortened muscle, or reefing the lengthened tendon. Hold the limb in an over-corrected position to stretch the opposing muscles. Sometimes silk tendons are used to steady the joint; sometimes the muscle or tendon is transplanted, or the joint may be ankylosed or resected. In a number of instances of spastic paralysis, resection of the posterior spinal nerve roots have seemed to improve the cases somewhat, as also has decompression operation on the skull in hemiplegias.

If a brace is used to prevent or correct the deformity, it should be taken off every day for a few hours and the child encouraged to make an effort to use the part involved, even if there is no response to the effort. During convalescence, where the arm is involved, the good arm should be placed within the clothes. In all methods of treatment, the reflexes, without doubt, play a most important part towards affecting a cure.

Continuous attention, not only by the mother and physician, but by the patient himself, must be urged, so that the child *mentally* tries to improve its nerve force of the part involved. As a thought conveyed to the brain may induce blushing, laughter, fear, increased appetite, etc., so can a thought to improve the circulation of any part of the body be taught to a child, by mental effort. Keeping a brace on continuously, the patient loses the value of the mental effort, and the physical action, and tends to increase muscular atrophy. Atrophy is synonymous with disuse; use and metabolism go together.

These patients tend to show an improvement for a given length of time, but there is a time when improvement comes to a standstill; some muscle or muscles seems to have lagged. This is the time for renewed effort or surgical intervention.

The office treatment consists in the application of some form of energy. As we all know, each of the different forms of energy such as heat, light, electricity, vibration, magnetism, sound, nerve force, are converted under certain conditions into one another; nerve force into light, as in the fire-fly; nerve force into electricity, as in the electric eel.

Any method of treatment that will improve the general health, such as medication, hygiene, fresh air, etc., or will improve the metabolism of the part involved, is good treatment. Also as massage, vibration, mechanical devices, heat, white light, electricity and last, though not least, psycho-therapeutical exercises, or muscle culture education, with reflecting mirrors, so the patient can easily see the part involved. The limb treated must be slightly flexed when the floor muscles are involved so as not to have the muscles in strain under treatment by any of the modalities.

I shall not describe the different forms of electrical currents, as galvanic, faradic, mixed, D'Arsonval, sinusoidal, high frequency, high tension of Oudin, Tesla, O'Farrel, but a thorough knowledge of the galvanic is primarily essential to understand the actions of the others, so I shall speak only of galvanic electricity, which can easily be obtained from the street current.

It is well at this point to briefly review the phenomena of electrical reactions in general to a galvanic current. In a healthy muscle, electrical stimulation from a faradic or galvanic coil produces a sharp response. A paretic muscle gradually loses

that irritability to response, so that very strong currents are necessary to produce contraction. A good diagnostic point is the feebleness of response and the wormlike character of the contraction. In complete reaction of degeneration, the muscles will not react to the strongest faradic or galvanic current.

The normal reactions are K C C followed by

A C C
A O C
K O C

This reaction is different in degenerate muscles, A C C producing the greatest contraction, so that in the use of the galvanic current it is advisable for many reasons to place the anode on the paralyzed muscles.

Do not imagine that you are going to strengthen a muscle or a nerve by pouring electricity into it. Stress animates, strain destroys tissue.

The time spent in the application of an interrupted galvanic electric current (Interrupted 72 to 110 times per minute, synchronously with the pulse), should not exceed five minutes daily, using not over 10 milliamperes of current, or the least amount that will produce a reaction; it is advisable early to use the anode on the paralyzed muscle, while the cathode which should be of a very large size, is placed centrally. If the cathode is used upon the paralyzed muscle, it must be continuously moved in order to prevent an excoriation. Before the current is used upon the patient, the limb should be thoroughly heated and after being treated with electricity the part is massaged for from five to ten minutes; then the patient goes through a course of voluntary therapeutic exercises, mention of which was made before. This educational exercise, no doubt, has more therapeutical value in the spastic cases than any other method of treatment. It is also used in all forms of paralysis with much benefit, and as before mentioned the mental effort should be used by the patient at home, morning, noon, and night.

THE PRE-CANCEROUS STAGE.

Clinical observation has shown that the life history of most cancers shows alerations in the tissue antedating the development of malignancy, and the plain teaching follows that such alerations in known cancer sites should be attacked surgically before malignancy develops. Such a course would constitute an efficient cancer prophylaxis.—M. N. HADLEY, in *The Journal of the Indiana State Medical Association.*

STRAIGHT DIRECT LARYNGOSCOPY, BRONCHOSCOPY AND ESOPHAGOSCOPY.

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BALTIMORE, MD.

(*Continued from March Number.*)

The writer's method of direct laryngoscopy. The different steps of the examination will be described in detail because the method differs materially from all other methods with which the writer is familiar. The two essential points of difference are the tube which has been described above and the position of the head which in nearly every case is practically straight when the instrument is introduced. Long ago the writer became convinced that relaxation of the neck muscles was the most important point in successful tube work. He believed that if such a method could be devised, direct laryngoscopy would become more popular and thereby more useful. No one will deny that the extended position of the head is unnatural and that it must be more difficult for patient and operator with all the muscles contracted. The operator must overcome this unnatural position by pulling against muscles that are already straining. The position originated by the writer has been used by him in adults and children for more than four years and has proved eminently satisfactory from every standpoint. It is easy to learn and will prove satisfactory in every patient regardless of physical conditions.

The patient is seated on a low chair which has proven more satisfactory than a stool because of the straight back against which the patient leans. The head, reaching just above the back of the chair, in most cases is held perfectly straight and supported in the hands of a nurse. The nurse is instructed not to hold the head but simply to support it. The operator stands to the left or right of the patient according as he wishes to enter the mouth from the corresponding side of the mouth. The pharynx is anesthetized with the curved applicator, alypin being used for this purpose as was pointed out under the chapter on anesthesia. After waiting a minute or two the instrument described above is introduced with the left hand between the left or right bicuspid teeth while the patient is instruct-

ed to turn his head slightly to the right or the left to bring the instrument and the larynx in the same straight line. As the tube passes down, the tongue is easily pushed to the opposite side completely out of the way. In a few seconds the epiglottis comes into view. At this point it may or may not be necessary to apply more alypin through the tube with the straight applicator which is carried directly into the larynx. The handle of the laryngoscope is now slightly depressed which throws the spatula end against the wall of the pharynx. The handle is now raised at the same time that the spatula end is pushed down for a variable distance but never more than an inch. Now by pulling gently on the instrument the entire larynx is seen. It is surprising how little force is used to expose the larynx and sometimes it seems almost as if the weight of the speculum does this. If, perchance, the anterior commissure is not seen clearly, the nurse is told to push the head gently forward. The writer has repeatedly demonstrated that with the head bent forward, just as good a view of the larynx is obtained as with the head straight. The invariable custom is to start the examination with the head straight. Occasionally in short thick necks or in young girls, it may be necessary to extend the head very slightly as the larynx is exposed. These cases are rare so that the proper name for the position of the head is the straight position. The writer knows of no other position in which the head is practically straight or bent forward throughout the examination and treatment except possibly Mosher's "left lateral route" which is used under general anesthesia. Brunings has said that it is not necessary to make special mention of the advantage presented by gaps in the teeth and that it is a much more important question whether in the case of protruding incisors or lateral gaps the spatula should be introduced from the corner of the mouth. He also says that autoscopy from the corner of the mouth requires far more practice, and that normally as he ascertained by a series of measurements, the autoscopic pressure is no less in this case than with the medial method of examination; that this at first appears surprising, because the corner of the mouth can be more easily brought into line with the prolongation of the trachea than can the upper row of teeth. That the reason is that, when the tube is placed laterally, pressure is not exerted on the middle of the tongue but nearer to its lateral attachment which is less yielding. This method is, therefore, only to be recommended in the special cases mentioned above. In answering these objections of Brunings it is only necessary to say that with the instrument used by the writer, one does not have to consider the advantage presented by gaps in the teeth; the tube slips in so easily that one scarcely knows when he is in the larynx and practically no pressure is exerted on any part of the tongue. As regards his claim that the corner of the mouth requires more practice, it can be said that visitors in the writer's clinic often succeed in passing the laryngoscope at the first attempt and are amazed at the ease with which the tube slips

Fig. 6. Straight direct laryngoscopy. Patient and operator sitting. Ten millimetre tube introduced between the left bicuspid teeth. This is the usual position for operative procedures in adults. In exceptional cases the head is extended somewhat.

Fig. 7. Direct laryngoscopy with the head bent forward giving just as good a view of the entire larynx as with the head straight. The instrument is the 10 millimetre tube. Patient and operator sitting.

into the larynx. The writer has made no measurements to learn the difference in the force used between the medial and lateral methods. But he knows from actual experience that it is much easier to pass his tube from the corner of the mouth with the head straight than between the incisor teeth. The photographs of the two positions will show the difference in the amount of force used better than any description. In any method of direct laryngoscopy, it is always well to pull the patient's lip up and out of the way of the tube for the pinching of the instrument may break up an orderly examination.

THE EXAMINATION OF THE LARYNX IN THE PRONE POSITION.

Under this heading will first be described the methods under general anesthesia and then those which are practicable and useful with and without local anesthesia.

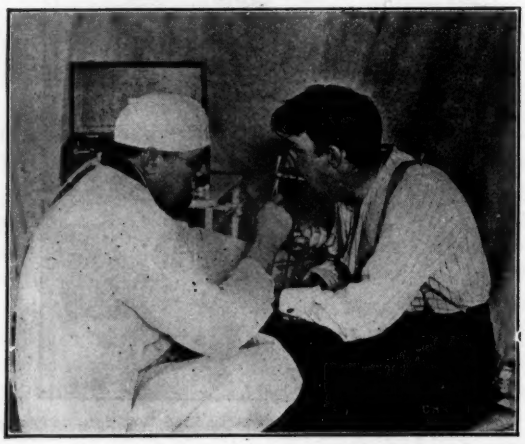

Fig. 8. Direct laryngoscopy with the head bent far forward. The entire larynx is seen. It is a "freak" method never used in operative work. It shows that extension of the head is not necessary if a small tube is used.

Mosher's method. In 1908 Mosher suggested a new method of examining the larynx and the upper end of the esophagus in his "left lateral route." So far as I know the method cannot be used without general anesthesia which is a disadvantage. The patient's head is turned to the left until the left cheek almost touches the plane of the table; the chin is then flexed on the chest. The operator sits on the left facing the patient's head and introduces the special spatula between the left bicuspid teeth, pushing the tongue to the opposite side. When the epiglottis is reached, it is hooked forward and the larynx is exposed. The instrument is used with an electric head light or with a light on the end of it. This method has not become popular because of the difficulties attending its use and because simpler methods have been devised. The position of the patient is awkward and it is difficult to learn to introduce the instrument quickly. It is more useful in upper esophagoscopy than in laryngoscopy.

Jackson's method. Dr. J. W. Boyce, working with Dr. Chevalier Jackson, has perfected a method of holding the head which is probably the best position, with the head extended over the end of the table. Jackson, in his book on tracheobronchoscopy, emphasizes the importance of having a trained assistant hold the head since it must be held just right if one is to work successfully. In this position the head and shoulders of the patient project over the end of the table; the assistant sits to the right of the operator with the right foot on the floor and the left foot on a low stool while the left arm rests on the left leg and the head on the hands. The operator sits on a low stool and with the head in proper extension passes the laryngoscope between the incisor teeth. The epiglottis, coming into view, is lifted and the larynx exposed. There are several disadvantages connected with this method, *viz.*: it requires the services of a trained assistant which are easy to obtain if one works always in the same hospital or can carry his assistant with him. If, however, he cannot obtain his assistant, it is difficult to do successful work. The instrument is suspended in the air with the left hand the forearm tires rapidly so that it cannot be long held in the strained position. In the writer's earlier work he had a patient with a tumor of the left anterior cord which was impossible of removal in the sitting position because the throat would not tolerate the large instrument then in use. The

Fig. 9. Straight direct laryngoscopy with the ten millimetre tube introduced between the left bicuspid teeth. Adult male. Local anaesthesia. This position is rarely used because practically all adults can be successfully examined and operated upon in the sitting position with the head straight.

patient was given ether and an attempt made to remove the tumor with the head in the Boyce position. It was found impossible to remove the growth because it was too far forward to see clearly. The writer's experience probably accords with that of many laryngologists in the early days of direct laryngoscopy. The large size of the instrument and the position of the head were drawbacks impossible to overcome. In the above case the patient did not return because of the sore throat from the large instrument. Today that tumor could be removed in a few minutes with the improved laryngoscope and the proper position of the head under local anesthesia. The cramped position of the operator on a

Fig. 10. Straight direct laryngoscopy. Instrument passed between left bicuspid teeth. Girl 17 years old. No anaesthesia. Patient not held.

low stool is another objection to the Boyce position, and lastly the fact of having the assistant in front of the operator is no small inconvenience. After trying the position faithfully, the writer concluded that he would have to simplify the work or give it up as too difficult.

Brunings' method. The position of the head is practically the same as in the Jackson method except that Brunings' allows the head to fall over the leaf of the table which has been let down. He thus dispenses with an assistant to hold the head. In passing his instrument, it is held in practically the same way as the Jackson tube. In all these positions of the head, it is difficult to work without general anesthesia. In the method to be described, one can operate under local anesthesis if necessary.

The writer's method. The patient lies on the table with the head straight, or, if the neck is short and thick, with a small pillow under the back of the neck to produce slight extension. The operator stands at the left of the table facing the patient's head and introduces the small laryngoscope between the bicuspid teeth with the left hand. The head is then turned slightly to the right and the instrument pushed rapidly down to the epiglottis which is hooked forward and the larynx exposed. The writer has succeeded in examining the larynx with this method when it was not possible to do so in the sitting position. The only assistant needed in adults is someone to stand at the head of the table out of the way of the operator to steady the head. This method is seldom used except for purposes of demonstration. Nearly all patients can be

Fig. 11. Direct laryngoscopy with the head straight on the table. Boy five years old. Patient not held. This was a patient with papillomata of the larynx who was repeatedly operated upon with the head straight. No anaesthesia, local or general was ever used. The patient has made a good recovery.

examined under local anesthesia in the sitting position. The writer cannot imagine a condition in which it would be necessary to give a general anesthetic for direct laryngoscopy except in children above the age of six years.

Direct laryngoscopy in children. This is the field in which direct laryngoscopy has its greatest usefulness. Before its introduction, the larynx in children was one of the darkest chapters in medicine. The inability of most laryngologists to see the child's larynx was not due to lack of skill but to the natural difficulties to be overcome. Even under general anesthesia with the child sitting, the difficulties of pulling the tongue out and removing secretion were so great that in many cases only a fleeting glance could be obtained and a correct diagnosis was impossible. In older children the examination was easier but in many cases the chil-

dren were hard to manage and results were far from satisfactory. Now, thanks to direct laryngoscopy, all this is changed and the treatment of diseases of the larynx has become an open book. Everyone must admit that direct examination is of more importance in children than in adults; but even greater difficulties are encountered as regards the size of instruments all of which are too large or too awkward in shape to expose the larynx quickly and easily. To see the child's larynx satisfactorily one must have a tube large enough to see and operate through, and at the same time small enough to be passed quickly without trauma. The

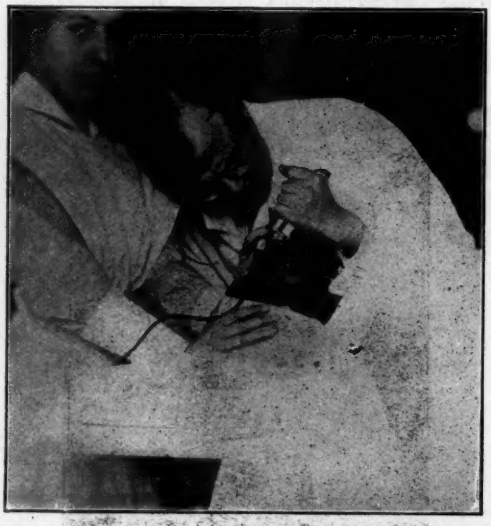

Fig. 12. Straight direct laryngoscopy. Ether anaesthesia. Instrument passed between incisor teeth. Boy 17 years old. Jackson's large separable speculum used preparatory to passing 9 millimetre bronchoscope which accounts for the fact that the head is not perfectly straight on the table.

instrument used by the writer has proven satisfactory in all cases during the past four years. It is the same tube which was described above as the most satisfactory in adults. It may be well to emphasize what was said about anesthesia under that chapter. The writer has not used anesthesia, either local or general, in the laryngeal work of children for four years. This statement refers to children under six years of age and he cannot think of a condition, operative or otherwise, which would compel its use. Anesthesia adds an element of risk which in the present state of knowledge, is not justifiable. Jackson, so far as I know, still uses the Boyce position in his work in children. The method of procedure does not differ from that described above except that he does not use anesthesia of any kind. The head is forcibly held over the end of the table during the examination or operation. While this position works fairly well, it cannot compare with the straight position, devised by the writer more than four years ago and used continuously by him since. Mosher's method can be used in children if general anesthesia is used.

The writer's method of direct laryngoscopy with the patient sitting. This method can be used in children up to eight years of age. The patient is pinned in a sheet so that movements of the arms and legs are reduced to a minimum. A nurse or assistant holds the child in the lap with the legs between the knees. Another nurse holds the head straight. The operator, standing to the left, passes the tube between the bicuspid teeth, forces the

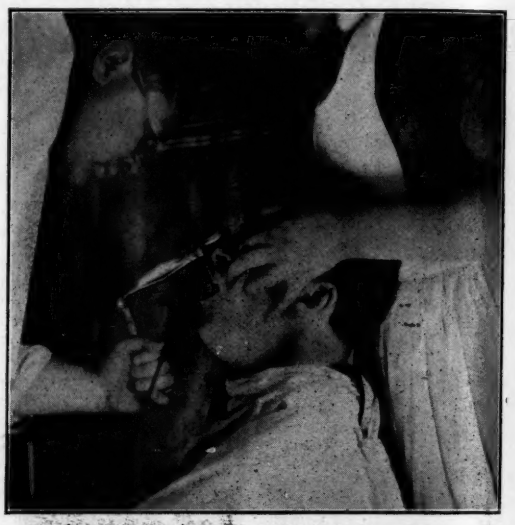

Fig. 13. A particularly difficult case of small papilloma on the left vocal cord just at the anterior commissure. With the small tube, exposure and removal were comparatively easy.

tongue to the opposite side, and when the epiglottis appears, hooks it forward with the spatula end of the instrument, and exposes the larynx. If necessary slight backward pressure may be made on the thyroid cartilage.

This method is described for the benefit of those who prefer to examine in the sitting position. The writer prefers the prone position because he thinks it is easier to control the patient. In this method the child is pinned in a sheet as above described and placed on the table with the head straight and steadied by a nurse, while a second nurse attends to the arms and legs. The operator stands to the left, facing the patient and passes the tube between the incisor or bicuspid teeth; he then pushes it rapidly down to the epiglottis, which is hooked forward or better upward and all parts of the larynx exposed. The examination, if one is at all expert, takes only a few seconds. This is an ideal method of examining the larynx in children because they

are under perfect control. One who has tried to examine the larynx with the head extended has been struck with its difficulties—it is almost impossible to keep the head still enough to introduce the tube; the position of the instrument suspended in the air is awkward and a great strain on the forearm while the operator is in a cramped position. Last, but by no means least, the position of the head and the instrument are unnatural, so to speak. The sitting position, while not so objectionable, is difficult enough on account of the struggles of the child. Contrast with these the position in which the head lies straight on the table; the nurse stands at

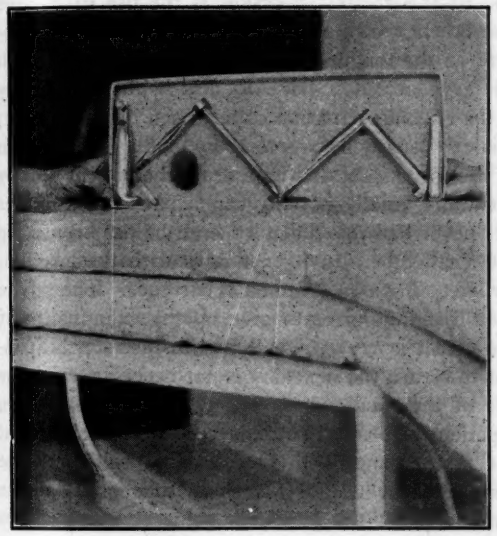

Fig. 14. Instruments used in direct laryngoscopy. To the left is the small modified Jackson tube with detachable handle so that the instrument can be used in the sitting or the prone position. To the right is the small separable speculum with detachable handle.

the head of the table to steady the head out of the way of the operator; the operator stands at the left in an easy attitude; in other words all the participants in the examination are in positions that are easy and free from strain. When one has tried both methods, no argument is needed to convince him of the superiority of the straight method.

In Brunings' book the writer has looked in vain for any special method of direct laryngoscopy in children so it is fair to assume that he uses the same methods as in adults. Nothing as to anesthesia is found except the table of the percentage of general anesthetics used in Killian's clinic. He does refer to the operative cases in children as being the most difficult in direct laryngoscopy.

No such objection can be made to the straight method for with a little experience it is one of the easiest procedures in surgery. That direct laryngoscopy is not used by every laryngologist as a routine measure is due to the multiplicity and the large size of the instruments. The writer is convinced of this from conversations with laryngologists all over this country. They say that they have invested in this or that instrument but that it is impossible to get a good view of the larynx. Some of them say that they have given up the work in disgust. This is a sad commentary on direct laryngoscopy which is one of the most useful procedures ever introduced into medicine. A short time ago a laryngologist from a neighboring state visited the writer's clinic to see direct laryngoscopy. He stated that he had just paid a big price for another laryngoscope which had proved unsatisfactory in that he had not been able to remove a tumor from the anterior part of the larynx because the

Fig. 15. Direct operation on larynx (with general anaesthesia and counter-pressure autoscopy). Brunings.

large instrument had caused the patient so much pain from the pressure used to see the larynx. This man had studied under Von Eicken in Freiburg and had paid about $30.00 per lesson for instructions from him. He talked as if he were disgusted with direct laryngoscopy. The ease with which the small modified tube was introduced and the larynx exposed to the anterior commissure made a profound impression upon him. To show him just what the possibilities of the instrument were, the patient's head was bent far forward with the result that just as good a view of the larynx for operative or examining purposes was obtained. In this position he was shown that with a bright light as the De Zeng lamp, one could easily see to the bifurcation. When he insisted upon an explanation, the writer told him that it was the instrument and no skill on the part of the operator. When he left, he said that he would soon have another laryngoscope. This story is inserted to show the impression made upon out-

siders by the small tube. Recently Mueller has made two tubes for the writer measuring respectively 18 and 14 centimetres in length and 10 millimetres in the inside diameter for use with the Brunings electroscope. They are easily introduced but the writer prefers the modified Jackson tube for reasons stated above.

Comparison between direct and indirect laryngoscopy. It cannot be denied that one can see lesions better through the direct laryngoscope than with the mirror or the pharyngoscope. But for ordinary office work it is better to use the mirror or the pharyngoscope because they do not take as much time. One who is expert with the mirror can usually make a diagnosis with little difficulty. In a few cases with a low hanging epiglottis and a large uvula, great difficulty may be experienced in getting even a glimpse of the larynx; in these cases the pharyngoscope usually fails us also. The main objection to the pharyngoscope is the distorted and unnatural image that any prismatic instrument gives. In children the writer never resorts to the pharyngoscope but examines with the direct laryngoscope at once so that, if an operation is necessary, it can be done immediately. If the mirror fails, it is the proper thing to resort to direct laryngoscopy at once; if, with the mirror, uncertainty as to diagnosis prevails, the direct method is used to get a better view of the larynx. A patient came to the writer some months ago with aphonia. Because of a low hanging epiglottis and an unusually sensitive pharynx, it was not possible to get a view of the vocal cords. Even after the use of cocaine the larynx could not be seen. With the small tube the larynx was examined directly and a diagnosis promptly made. To sum up it may be said that the mirror is the instrument of choice in routine office work; that in those cases in which the mirror or the pharyngoscope fails, the examination can be successfully made with the direct instrument; that in children it is a waste of time to try the mirror or the pharyngoscope because the examination by the direct method is quickly made and the operation, if necessary, can be performed at the same sitting. For all operative procedures in the larynx, the direct should always be preferred to the indirect method because one can see so much better what he is doing. For operations in the anterior commissure, the mirror has an element of uncertainty which makes its dangerous.

Mistakes in passing the direct laryngoscope. The most common mistake in passing the tube is probably pushing the spatula end of the instrument too far down back of the larynx. The patient immediately begins to choke and to make attempts to pull the instrument out, The mistake should be rectified by gently pulling the tube up until the arytenoids appear when the epiglottis is pulled forward. This mistake is more apt to happen with a large than with a small tube because with the large tube the muscles are on the stretch which makes orientation more difficult. With the small tube, passed slowly, it is practically impossible to miss the epiglottis and arytenoids. Another mistake by beginners is the attempt to pass the tube too rapidly. Direct laryngoscopy should be done slowly and carefully especially if it is the patient's first experience. The writer thinks that one of the greatest mistakes is the use of a large instrument which always requires more or less pressure on the tongue and gums. One difficulty which all laryngoscopists have to deal with occasionally is the choking sensation experienced by the patient; this can usually be overcome by gentle manipulation of the instrument and reassuring the patient that by breathing quietly nothing can happen. The writer has never had this difficulty since he has been using the small tube. In former days with the large instrument it was a common occurrence. The advice that Brunings gives to give up the examination if the throat is very irritable and to instruct the patient to return the next day is not necessary with the use of the small tube. The writer has never seen a patient who could not be successfully examined at the first attempt with the straight position of the head and the use of the small tube provided the patient is not the victim of some chronic nervous disease such as chorea, etc.

(*To be continued.*)

HAND INFECTIONS.

To deal with hand infections successfully with the preservation of the greatest functional results, one must have a very definite mental picture of the anatomy of the part. It matters little whether you can name the structures, provided you know the function of the various structures and their relative positions. In infections, the most essential anatomical structures are the various tendons and their synovial sheaths. The tendons, because if they are destroyed or left fused together, movement in the parts supplied by them ceases. The synovial sheaths, because by their presence infections are easily disseminated and their effects rendered more disastrous. The lympathics, which in the forearm and arm play so important a rôle in the spread of infections in those localities, may be disregarded in considering the spread and treatment of hand infections.—IRVING S. HAYNES, in the *N. Y. Medical Journal.*

THE EPIPHARYNX IN CHILDREN.

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We can almost make the statement that the only importance of the epipharynx in children as well as in adults lies in its association through the Eustachian tube with the ear, for with few exceptions we are called upon to treat this area for some resulting or threatened aural pathology. As over 90 per cent. of all pathological conditions met with in otology are due directly or indirectly to some pre-existing pathology within the epipharynx and Eustachian tube the study of this area becomes the foundation upon which rests otology. Anything which we can do to prevent aural complications or anything which we can avoid doing that may be liable to result in conditions favoring otological disease should be followed with as keen interest and care as the more spectacular and brilliant procedures to combat the later advancing disease in the middle ear, mastoid cells, labyrinth and cranium. The majority of us will agree concerning this subject and yet there is not one of us to whom it is not more fascinating to perform the major surgery than it is to carry out the sometimes protracted and tedious work of discovering and removing the frequently seemingly less important etiological conditions within the epipharynx. The ideal which we must strive to attain is to be able to not only diagnose all the pathological conditions within the epipharynx but to be able to so combat and eradicate them as to prevent their extension into and their effect upon the aural structures. This ideal opens up a field which will doubtless give lack of interesting research for many years to come. I believe that by improved methods and with more definite knowledge we shall be able to preserve more and more ears and thus prevent a great loss of proficiency not only to the individual but to society in general.

Since 1885 when Emil Mayer presented the result of his studies upon the epipharyngeal hyperplasia of Waldeyer's ring of glandular tissue, volumes have been written concerning this subject. But today, in spite of all that has been written on adenoids in children we find there is so much concerning etiology, treatment and prognosis that is in doubt that we cannot make a positive statement that can be applied in general to this common condition. Our knowledge concerning the acute and chronic inflammations of the epipharynx, whether due to local infection or existing as sequelæ of various pathological conditions of other organs, is also so far from positive that we must still continue to study them in order, if possible, to establish sufficient facts so that we shall be able not only to make a correct diagnosis of epipharyngeal disease but, in a large percentage of cases, be able to ascertain the etiological factors producing these pathological changes; and shall also know when and how to proceed with the treatment, operative or other, for the best future as well as the immediate results in the individual case. Some will think it strange that I should raise the question in regard to epipharyngeal adenoid hypertrophy, for they will say, "If there is adenoid hypertrophy, just remove the growth and that will be the end of the trouble." I wish it were so.

We all know that there are many children who are afflicted with middle ear disease who have adenoid hypertrophy and are entirely relieved when this adenoid obstruction is removed, and we also know that there are many other cases which are helped for a short while and then become as bad as before. Some of these have recurrence of adenoid hyperplasia but many do not. Some cases are not helped in the least by an adenoid operation and may be even worse than before. Quite frequently we find in children, as well as in adults, a marked tendency to epipharyngeal and tubal disturbances with the resulting aural complications, who have anatomically an apparently normal nose and epipharynx. Again there are many cases where some deformity is found in the nose or post-nasal space and when these are corrected there is no apparent improvement. We have only to review the special literature to see how prone we all are to become narrow in our observations and to consider our subject as that of an isolated field free from external influences. Although it is at present not possible with all our aids in investigation to always feel sure of our ground it is our duty so far as it is within our power to consider abnormal conditions within the epipharynx from various viewpoints before deciding upon a course of procedure.

Before I took up my special study of the epipharynx I questioned why there should be such a difference in the results following apparently the same operation for apparently the same pathological conditions; but I had not reckoned sufficiently with the various resulting influences of the same amount of excessive tissue due to the difference in shape and size of the epipharynx and the varying position and patency of the Eustachian tube nor had I given sufficient consideration to the resulting cicatricial tissue which follows the usual operative interference for the removal of the epipharyngeal adenoid mass.

The adhesions found in the lateral fossæ, the semi-atrophic areas sometimes found in the vault of the epipharynx with the resulting interference with the pharyngeal end of the Eustachian tube, in patients operated upon by our most skillful throat surgeons, make us stop to question. While we are studying this subject we can easily become pessimistic and be led so far toward the side of no surgical interference as not to be conservative. It is not the purpose of this paper to court pessimism but to present some facts which will show that we are but beginning to learn the rudiments of the subject which has been so studied, hashed and rehashed for nearly 30 years.

Were it not for cicatrices and their effect upon the Eustachian tube the subject of adenoids would be of little importance for, with our present knowledge, the immediate resulting effects of the adenoid operations are very rarely bad and frequently the individual is improved in many respects. The results are so excellent in many severe cases that the physician of moderate training and ability as well as the guardian of the child is frequently led to think of an adenoid operation for all the ills of childhood from indigestion to enuresis. During the past few years it has become the pastime of the mediocre family physician to advise and try to perform an adenoid operation upon every child who shows any symptoms of ill-health. In many cases little is accomplished or little trauma produced but often the walls of the lateral fossa are injured, and I have even seen the mucous membrane and also the cellular tissue removed to such an extent as to bare the bone in epipharyngeal vault.

The unskilled work in the epipharynx does not concern us so much here; but the work performed by our school physician and nurses, complemented by the hospital out-patient clinic, does. The school children in our cities are referred by the young school physician and conducted in droves by the school nurses to the various clinics and we, as a rule, are prone to give them a quick glance and then pass them on to the young interne or assistant surgeon for operation. I believe in this manner we are committing one of the greatest medical crimes of this generation for a large percentage of the children not only do not need an operation in the epipharynx but would be far better off without it. Under the usual methods of examination, it is easier for the overworked men in the clinic to pass on to the operating room these cases than to carefully examine them and disagree with the school physician; but I believe we should select all doubtful cases and have two or three men in the clinic pass upon them and then, if thought best, refer them back to the school physician stating at time of examination we did not deem operation advisable but would like to again examine the patient if symptoms should ever arise suggesting naso-pharyngeal disturbances.

There can probably be no cause for discussion concerning the advisability of removing a large central adenoid mass which hinders respiration or presses upon the cushion or overlies the pharyngeal orifice of the tube but in these cases great care should be used so as to avoid injuring the cushion of the tube while removing the adenoid tissue; and our whole duty has not ended with the operation, however skillfully performed. These patients should be examined within a few weeks after the operation to learn if there has been healing without adhesion or other deformity. If we can impress the advisability of this examination upon the guardian of the patient as well as upon the medical profession in general we shall have done much to protect our patients against evil or unsatisfactory results which sometimes follow the operation for the removal of adenoid hypertrophy.

One of the reasons for presenting this subject is to ask have our methods of examination in the past been such as to enable us to so carefully diagnose the conditions in the epipharynx as to tell what cases need surgical interference and what cases will best be cared for by other means? In marked cases we can say *yes,* but in a large number of cases we must say *no.*

With the naso-pharyngoscope it is possible in the majority of children over 4 years of age to inspect the epipharynx while at rest and during the act of deglutition. This has been of great assistance and satisfaction to me in all these cases where the nasal passage was sufficiently large and the child was under control, but in younger children and in those who are timid and cannot be controlled, it is frequently difficult and sometimes impossible to pass the instrument through the nose. The epipharyngeal space is small and digital examination is frequently misleading even with a long slim finger. In these cases it is usually impossible to satisfactorily examine with a post-nasal mirror, for the child in resistance and crying closes the pharynx from the epipharynx. I have been very anxious to examine these little patients as I could older ones for the knowledge gained by vision is usually much more definite than that of speculation or even that of palpation. Last Spring I devised a tubular speculum which can be slipped behind the soft palate and, by sliding the retractor, will carry the soft parts

so far forward as to expose the whole epipharynx. The naso-pharyngoscope passed into the speculum lights up and gives a view of the entire epipharynx. This method is not as good as the one of passing the endoscope through the nose for there must be some distortion produced by any instrument which draws upon the palate. It is not possible to observe the effects of deglutition but it is an advance and a great aid in the examination of those cases which cannot be examined through the nose. It shows perfectly the amount and location of the adenoid, its relation to the tube, the general condition of the pharyngeal end of the tube and the condition of the posterior ends of the turbinates. It can be used by anyone of ordinary ability and little more time is necessary than for the use of a tongue depressor in the inspection of the pharynx. With the patient's head held firmly by a nurse or assistant and with a gag between the teeth it is possible to use this instrument even in a resisting child.

In a great many cases where there is a low type of middle ear disease, and where there is some obstruction to normal breathing, and where without special study of the case we would be tempted to advise immediate adenoid operation, we are able to so change the habits and hygiene of the child as to get relief of the existing interference and to prevent the liability of its recurrence. It is surprising how quickly epipharyngeal disturbances will arise as soon as the patient is subjected to the overheated and excessively dry air of our modern heated and often poorly ventilated rooms and it is equally surprising how quickly such a patient will improve as soon as more moisture is added to the living and especially to the sleeping room. We have all seen children with epipharyngeal hypertrophy with the associated and resulting symptoms after having lived in unhygienic surroundings during the winter go in the springtime out into the open country and sleep in the normally moist air and begin to immediately improve of their symptoms. An examination of these cases in the autumn frequently reveals no pathologic condition. We realize that there are many children coming to our clinics from very poor surroundings for whom little can be done to change the unhygienic mode of living, yet in these cases we may be able to accomplish something through the aid of the social service workers. Efforts in this direction are often more important for these unfortunate little patients than the simple operative measures performed more or less as a matter of routine. In all of these cases where there is any doubt as to the advisability of operating for adenoid or other naso-pharyngeal conditions the time which would be necessary to carry out operative procedure will in most cases be sufficient to place them in the proper departments for general investigation and many can be given relief for the existing symptoms.

Many cases of epipharyngeal inflammation hypertrophy are due to septic foci within the nose and are relieved by treatment of the existing nasal disease. Deformities within the nose are frequent etiological factors in producing epipharyngeal inflammations and hypertrophies, and their correction often results in the relief of these conditions. Too often we see, especially in children, operative procedures within the epipharynx when the fundamental cause of all existing trouble is within the nose. A good view of the posterior nares will often give a clew of the etiologic rôle played by the nose. If there is marked hypertrophy of the posterior ends of the turbinates or if there is a purulent secretion flowing over them we can often find the source of the trouble within the nose. Until these causes are relieved we can not expect any permanent relief of the resulting pathology within the epipharynx.

Having considered the general associations of epipharyngeal disease in children we now come to the subject of therapeutics, which is naturally divided into general and local. Although the general therapeutics is frequently fully as important as the local it has to deal with the treatment of so many systemic conditions that may act as etiological factors in epipharyngeal disturbances that it is too extensive to be discussed here except in a very general way. Gastro-intestinal disturbances must receive attention. The epipharynx in childhood, as well as in adults, is almost always affected by attacks of indigestion and constipation; and diet, together with measures to regulate and so far as possible correct these defects, is of great importance. Malnutrition and anemia are not always the result of epipharyngeal inflammation and swelling but are often etiological factors in these conditions. This fact should be kept in mind as we should not subject these patients to local treatment until we have carefully studied their general condition and have eliminated as far as possible all contributing causes.

Children who are subject to acute epipharyngeal inflammations should be warmly but not excessively clothed. They should be given all the fresh air possible, but they do not withstand excessive draughts of air especially while sleeping. They should be given sufficient exercise but more care is often necessary with them while they are at play than with the child of greater resistance. They must be more careful after becoming heated not to sit in draughts or lie upon damp cold ground. It is often difficult to decide how much care to exer-

cise in any case. We must not coddle them too much nor should we make them too apprehensive of trouble every time they happen to be exposed to draughts or dampness. We must try to gradually harden them to exposure but nothing is gained if we carry our hardening methods beyond a point followed by healthy reaction. In the anemic and frail child who is very prone to frequent and often severe attacks of epipharyngeal inflammation as well as in those who suffer from a chronic condition, the syrup of the iodide of iron is often of considerable service.

The infections of the epipharynx being almost always associated with similar infections of the nose and frequently associated with like oro-pharyngeal infections often demand treatment simultaneously with these adjacent cavities. In epipharyngeal infections, as aural complications are frequently of great importance it is essential that early treatment be applied which may prevent severe aural extension. In the early stages of congestion of the nose and epipharynx the patient, if possible, should be placed in a room with plenty of warm, moist air. A small dose of Dover's powder with some hot drink often aids by stimulating the skin to greater activity. A saline or a dose of oil is advisable especially when the child is inclined to be constipated. In young children we must generally advise against the use of douches even when there is hypersecretion, as there may be more danger of injuring the Eustachian tube and ear than of protecting them against the advances of the infection. Steam with the vapor from tincture of benzoin may be of service. A spray of benzoinal and resorcin is often efficacious. Heat applied to the sides of the neck near the maxillary angle is of marked service in allaying many of the acute epipharyngeal congestions. Often very satisfactory results can be obtained by applying to the nose anteriorly an ointment of hydrastin muriate gr. 3, menthol and eucalyptol, aa gr. 7, and lanoline oz. 1. Only a small amount of this ointment should be applied at one time and three applications are sufficient for a day. A 10% to 20% solution of argyrol applied to the epipharynx either by the Eustachian syringe or by dropping through the nose has been found to produce very satisfactory results in a large number of these cases. Where these inflammations are accompanied by marked swelling and with extension into the tube and ear and where there is complete blocking of the tube with the resulting middle ear inflammation whether or not there is secretion within the middle ear and bulging of the membrana tympani quick relief of the ear condition can usually be obtained by injecting a solution of cocaine and adrenaline into the Eustachian tube and following this after a few minutes with an injection of argyrol. In young children or in older children who rebel against treatment we sometimes find it hard to use the Eustachian syringe. In these cases the patient's head can be held in Rose's position and tilted toward the affected ear and the solutions can be dropped through the nose and allowed to flow toward the orifice of the tube. It is much more satisfactory where possible to use the syringe under the guidance of vision. This is true in regard to all treatment of the epipharynx especially when working about the orifice of the Eustachian tube.

Chronic epipharyngeal inflammation may produce a simple hypertrophy with or without purulent secretion or may go on to atrophy of the mucous membrane and to the underlying structures. Except in the after results of severe epipharyngeal diphtheria it is very rare to find an atrophy of the mucous membrane in young children. The chronic inflammations are frequently associated with or due to septic nasal inflammations. In chronic epipharyngeal inflammation even in young children we must never forget syphilis as a possible etiologic factor. Chronic purulent epipharyngitis in young children is often very hard to treat. It is frequently the result of a chronic purulent condition somewhere within the nose which it is impossible to definitely locate.

In all our work within the epipharynx whether for exploration or treatment we must use great care for the mucous membrane of this area, especially that covering the Eustachian tube, will not stand harsh treatment and much injury may follow careless treatment. In cases where it is necessary to remove bands or growths in the lateral fossa or to treat any pathological conditions about the orifice of the Eustachian tube it is possible to proceed with greater precision when the operative field is under vision. This is accomplished when possible by passing an endoscope through the opposite side of the nose and the operative instruments through the same side as the lesion to be attacked. Dr. Yankauer has demonstrated the direct method of attack through his direct speculum. In a recent paper Dr. Beck has described a method of operating upon the epipharynx under direct vision. He passes a rubber tube through both nostrils and then carries the ends through the mouth. By applying traction he lifts the soft palate forward. I have not had sufficient experience with this method to pass judgment upon it, but thus far I have been unable to view the cushion of the tube or the lateral

fossa. In very young children it is frequently impossible to operate upon or treat the epipharynx under vision by the aid of the endoscope. The nasal passages are frequently too small and it is impossible to keep the patient sufficiently still. I am of the opinion this is also true with Dr. Yankauer's tube. I am trying in these cases to pass the curette and forceps by the side of the palate retractor and then use them in the epipharynx under the guidance of the scope passed through the tube of the retractor. As yet I have not developed a sufficiently positive technic to be able to proceed quickly and accurately but I hope and believe it will be possible to accomplish this in time. It is fortunate that in the very young child and in other children who have not been subjected to trauma it is rare that we find adhesions in the fossæ or a demand for surgical treatment for the existing nasal disease.

What we most need at present is more proficiency in examining the epipharynx, especially in children, and more conservatism in treating the pathological conditions found in this space. In order to fulfil these demands it is imperative that we take a wide and comprehensive view of every case before deciding upon the best course to pursue, keeping always in mind that the important object is to prevent aural disease and to relieve as far as possible any existing pathological conditions within the ear.

THE ETIOLOGY, PATHOLOGY AND TREATMENT OF PHLEBITIS.

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(*Continued from the March issue.*)

MICROSCOPICALLY.

Acute Phlebitis. Taking a cross-section of a vein in an acutely inflamed condition we find the following condition: the entire field seems infiltrated with red blood and white blood cells; the endothelial layer of the intima has become very much flattened or stretched, each endothelial cell seeming very thin, this thinness varying in different localities. Beneath this endothelium we find that one bundle of thin muscle fibers is separated from another to a marked degree. The individual small bundles seem to take the stain poorly and there is much brown, granular débris within and between the muscular meshwork. The underlying thin, white fibrous layer does not look so markedly changed except for the infiltration by the blood cells and serum. The media shows the characteristic circular arrangement of the muscular fibers. Occasionally there will be seen a bundle of these fibers singled out as if under high pressure. The circular fibers seem to be thinned out and flat while they are well infiltrated with brown granular material of deep reddish brown tint. In fact this granular material seems very predominant and is of extreme importance because of the dependence for work upon what muscular material there is left. All of the muscular fibers are thin, taking the acid stain poorly and breaking at most dependent connecting points. Here and there we find that the muscular fibers fail to stain to any degree and that atrophy is a marked feature.

The adventitia shows a number of changes very characteristic of this condition. The inner layer of the adventitia shows much granular degeneration of the longitudinal muscle fibers. Fairly well colored dark brown granules are thickly scattered within the muscle itself. The muscle fibers are very thin, taking the acid stain poorly while in places the stain is wanting. Atrophy is a predominating feature and the minute fibers seem stretched to a fine thread. An occasional minute bloodvessel, overdistended, and filled with red blood cells is seen within this muscular coating. This blood within the lumen will show various stages in fully organized clots, semi-organized clots and again quite normal with less crowding by the cellular blood elements and more fluid or serum.

The connective tissue of the adventitia is mostly of white fibrous tissue. In fact the white fibrous tissue is the most predominating factor at this point. There is much infiltration of the fibrous substance, red blood, and white blood cells being plentiful. The various strands of the tissue are separated by this infiltration and much serum gives the whole area a depreciated value. The connective tissue takes a pale green or pearly white color and the individual fibers by a very low refractive power show much weakness. Fine granules are present everywhere.

Now and then we come across a larger or smaller bloodvessel. Some of these vessels are entirely empty, strange as that may seem. On the other hand many of these little vessels are overcrowded with red blood cells. In some of the vessels there are larger or smaller interspaces between the red blood cell impactions, showing serum to be present in plentiful amount. Some of these vessels contain well organized blood clots and here and there are those semi-organized.

Near the periphery of the adventitia will be seen an occasional small nerve ending. These nerve endings contain much granular material and show the

overworked condition in which they are. The nerve substance is cloudy and fails to take a clear stain. This would serve to bear out my hypothesis as to the cause of pain from phlebitis.

On the whole, we find the lumen of all the involved veins very much distended. They are crowded with red blood cells; some having the inter-spaces between the colonized groups of red cells filled with serum. Great numbers of these lumena contain well organized blood clots which take a deep brown or bright reddish brown stain. Now and then we find a semi-organized clot. Under these circumstances, the red cells are much crenated and the white cells very granular, many having lost their nuclei.

Looking over many fields of these veins I find that at times the entire vein wall seems much conglomerated and granular throughout. The acid stain, under these conditions, takes best within the innermost margins of the wall outside of which are found the pale yellow or brown stain encased within a margin of pale pink. Under the 1/6 projective it is at times very hard to find any beginning or end of the vein formation. The veins under such circumstances are simply designated by exclusion in comparison with the surrounding structures. This condition seems to be most constant in those cases where the disease is of long standing or fulminating from the start.

While examining a number of sections made in the long axis of the involved vessels, I found well organized clots of varying lengths completely occluding the vessels and very adherent to the vessel walls. Under dissection for gross specimens to be used in section work, I found these clots in length from one inch to two and a half feet, depending upon the size of the vessel in question. I recall a case where the thrombus completely occluded the tibial, popliteal and femoral veins for their entire length. This followed pneumonia in a little boy with a natural fatal ending. This case is not included in this series of statistics, however, as it occurred since the compilation was completed. Nevertheless it is very interesting and provides a formidable example of what may be possible in the extension of thrombosis.

Suppurative Phlebitis. Under this heading we are dealing directly with an infective condition; in other words the condition is one which is very apt to spread more or less rapidly, limited only by the conservative powers of the individual in question. Not only is the vein itself involved but the supporting structures surrounding the vessel are also much infiltrated with pus and lymph. Macroscopically we find all parts much thickened and necrosis is a prominent factor. Here and there are minute pustules of *greater* or less *capacity;* shreds of lymph adhere to all the surrounding structures and the veins themselves are completely occluded by a mass of pus, blood and lymph. The entire structure is very friable, is easily punctured with a blunt instrument and will not retain sutures and, when cut, leaves material adherent to the knife blade, while studs of lymph and fibrin are plentiful.

Microscopically, a cross-section of this vein shows the mural structures to be more or less indistinct as far as individual layers are concerned. Each layer appears well glued to its neighbor and the walls assume the appearance of a mass of fibrous tissue undergoing necrosis and at the same time are markedly infiltrated with white blood cells and fibrin. The mural layers take the acid stain very poorly, yellow and brownish fields being more abundant but not marked by brilliancy. Everywhere can be found polynuclear leucocytes taking the alkaline

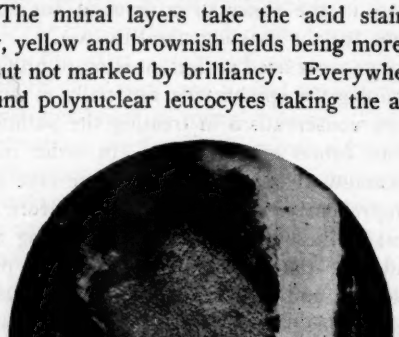

Fig. 8. Femoral vein × 100 into which culture of B. Coli communis has been injected, Guinea pig. Note mural leucocytosis, perivascular hemorrhage and small round cell infiltration of vessel wall. At the free border of the thrombus a suggestion of separation of the intima is seen.

stain unusually well and giving the whole field an appearance of spotted blue. The lumen of the vessel is entirely occluded with a material containing only a few red cells, many white cells and much fibrin. This pus clot is firmly adhered to the periphery of the channel and has a soft appearance. The supporting structures surrounding the vein are undergoing a coagulation- and degenerative-necrosis assuming likeness to death en masse. Many well-stained polynuclear cells are found all through this tissue and shreds of fibrin are very plentiful. Many areas reflect a black unrecognizable mass of dead material. Few of the muscular striations are brought out well while atrophy through the channel of sudden necrosis is most important. Minute collections of pocketed pus cells can be seen every-

where, some of which have burst spontaneously while many others are intact.

Chronic Phlebitis. Here we meet the tortuous, calcified, over-distended veins of a long standing ailment. Grossly the veins can be seen beneath the skin, snake-like, winding and unwieldy. To tactile sense they feel like knotted string or rope and at times can be easily rolled beneath the finger ball. Here and there will be felt larger or smaller areas that seem more resistant than the other parts and have a scratchy tendency.

Cutting across a section we find that the knife blade remains practically clean. As pressure is brought to bear upon the blade certain gritty areas will be felt as they are cut through. If these areas are scraped with a knife, a gritty material is freed, which feels like sand when rolled between the finger tips. The venous channels are left gaping and empty, except for an occasional small stringy clot. The elasticity of the vein wall is absent and the ends pout, while the venous walls are thickened to a marked degree. The surrounding, supporting, soft structures are not markedly altered. The muscular and fibrous structures seem to be in good condition so far as a relative value is concerned. These soft structures cut easily and leave a clean knife blade behind.

Microscopically, a cross-section will show the veins to be practically empty. Here and there an occasional vessel is seen partly filled with blood, but this is not common. One very noticeable thing is the absence of intima reduplication acting as valves for column support. In nearly all of the specimens examined this was so. The endothelium of this intima was very flat, shining and glistening, and in many of the sections examined, there were seen larger or smaller areas taking the pale stain of calcified tissue. However, numbers of the section showed none of this calcified deposit. The lumen of all the veins seemed large as if it had been over-capacitated for some time. The basement structure of the intima was thin and did not take either stain well. The media showed in many sections a tendency toward increase in muscle fiber elements. Again there would be fields where the muscle bundles were small, taking the acid stain poorly and showing evidence of atrophy. Calcified areas were found deposited in the muscle bundles of many fields. This, however, was not a constant factor, and in many instances it was wanting. The adventitia of many fields appeared normal and took the stain fairly well. The scant muscle bundles were absent in many instances where they might be expected to be found. Other sections showed the white fibrous structure to be overdeveloped or hyperplastic. Again we found that this fibrous structure was very much thinned and took the stain very slowly. This portion of the venous structure was not by any means free from calcified areas. The supporting, soft structures did not vary greatly from the normal except for patches of calcarious deposit. These parts stained well and seemed fairly healthy.

Longitudinal sections from the same specimens showed very tortuous courses in the veins. They would appear and disappear alternatingly for some distance. One thing was prominent in the longitudinal section work, namely, the presence of more blood in the veins. Small clots were seen here and there although they did not always over distend the vessel.

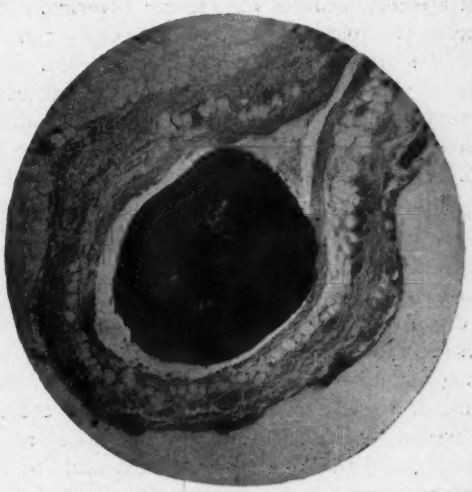

Fig. 9. Phlebolith of vesical plexus. Note absence of intima, the density of the coagulum and the vacuoles in the media. × 60.

TREATMENT.

In treating phlebitis cases certain general rules can be carried out in every instance and again other things have to be considered according to the location and the part involved. We must also consider the individual himself. For the present we shall consider only the acute forms of phlebitis and their treatment will be covered under the three headings just outlined.

All phlebitis cases, so far as treatment is concerned, can be summed up in the word, "rest," and following such, the result, in most instances will be, "repair," permanent or temporary. General hygienic rules should be adhered to very closely in every case. Here, as with any other pathological condition, fresh air, proper care of the skin by bathing, body cleanliness throughout, protection from exposure, proper bed and body clothing, sun-

light and suggestive influence resulting in established confidence, all play their important parts.

A feeling of well being should be encouraged at all times. All phlebitis cases are slow in recovering and to keep the general mental tone high is to encourage more rapid recovery. The entire body should be bathed daily with alcohol and water supplemented with a soap-suds cleansing twice a week. Following such a bath the skin should be well frictionized, thus increasing the superficial circulation and drawing away from the point of disease as much as possible. One rule is always to be applied, *i. e.*, never frictionize over the area of disease but draw the blood elsewhere thus allowing the diseased area to remain at rest.

The bed clothing should be light but warm. This class of cases seems to do better in linen sheets with light all-wool blankets for the top covering. Any discomfort from heavy clothing weighing down upon the diseased area, should be avoided. The diseased part can be protected by a cradle or other improvised frame for holding up the bed clothing. Flannel night dresses serve best to come next to the skin. If any underclothing is worn in bed (it is far better not to wear any), it should be of the silk-wool variety with very fine texture.

Heliotherapy plays an important rôle in this disease. If possible, expose the involved part to the direct sunlight for at least one hour daily. All cases seem to have a shortened convalescence by following out this rule. In fact, if the patient could recline in a solarium during all of the day the entire system would benefit much by the exposure. In addition, the part for special attention could be exposed by removing the covering for the one hour needed during the period of maximum sunshine. Patients will do better in a well ventilated room by themselves than in a ward. The room temperature should never be above 65°, and free circulation should be established.

The alimentary tract should be very closely watched in order that the bowels may move twice in each twenty-four hours. If they will not do so naturally, a mild cathartic should be given. Three times a week a high enema should be given that the entire intestinal tract may remain clean. Of course, where local intestinal trouble is present, as in typhoid fever, or in cases where for other well-founded reasons such disturbance is bad, this procedure should be omitted. In general, however, this rule for cleansing should be followed. Plain suds and water, two quarts in amount, never forced, seems to do the work best. Under no circumstances should the bowels be allowed to become constipated.

The diet should be carefully supervised from day to day. In typhoid cases this needs special care, as also when other abdominal viscera are involved. Whenever the veins of a serous cavity are involved, especially when that cavity is the abdominal, the closest care, as to diet, should be taken. In those not suppurative, the nourishment should be liquid and that well selected. The broths and soups should be strained, the fruit juices should not contain any pulp, the milk should be diluted with water and the proper amount of lime water added. Thus it will be seen that only a liquid diet is permissible. The heavier and full strength liquids are not easily digested. Any nourishment forming large curds in the stomach should be excluded. Water should be given very freely and the patient should be encouraged, coaxed or even gently forced, to take more than the amount to which he is accustomed.

Fig. 10. Vessels of groin of Guinea pig into which alcohol has been injected. There is thrombus of the femoral and smaller veins. The artery as usual escapes.

When suppuration is present as a complication of the venous condition within a serous cavity, far better results are obtained if the patient be Ochsnerized. Everything except water is withheld for intervals varying from three days to a week. This rule should be closely adhered to, if the best results are to be obtained. In all internal suppurative conditions the general system is undergoing a continuous shock, so that any extra burden in the form of food does more harm than good and merely adds to the work of the functions already overtaxed.

After the critical points are passed and reactionary resistance comes forward, we can begin to give nourishment. Only the most easily cared for liquids should be given at first; as malted milk, albumen water, orangeade, grapefruitade, lemonade and plenty of water. Guided by the care the patients

take of this amount of nourishment, it should be gradually increased to a full liquid diet. I have found that egg-nogs, raw eggs and malted milk egg-nogs serve to aid in these cases at this time.

Gradually a semi-solid diet is begun while the milk, eggs, egg-nogs, plain and with malted milk are continued. If this diet is well received the full house diet can be given and from this moment on rapid advances toward recovery are made. Each case should have his individual immunity well established before forced feeding is commenced.

The general systemic treatment can be classified under two heads; namely, superficial and deep.

SUPERFICIAL TREATMENT.

Under this heading the acute and chronic phlebitis cases are to be considered.

Acute Cases.—Here we have to consider a condition very prone to extension, more or less rapid and at times extremely liable to thrombosis. Two things we desire to accomplish, one being limitation of the disease, the other prevention of occlusion of the vein or veins involved. To accomplish these ends the part should be kept elevated.

Let us take as an illustration the involvement of the veins of the lower extremity. The limb should be elevated upon a well padded inclined plane at an angle of forty-five degrees. By so doing the blood is allowed to drain back into the larger channels and thus prevent extreme stasis, and thrombosis is far less apt to occur. Swelling is kept at a minimum and the skin maintains good nourishment, elasticity and tone. The member should be carefully wrapped in sheet wadding or absorbent cotton held in place by very light gauze bandaging. The limb is then placed in a comfortable pillow cradle resting upon the inclined plane while a good position should be maintained by keeping the toes up, the foot held at right angles to the limb and the heel supported so that no extra pressure will come upon it. Under *no* circumstances should the part be massaged, and rough handling and jerky movements should be avoided. It is a good plan to bathe the skin with an alcoholic solution, using a soft sponge and avoiding rubbing. Dry the skin by fanning and then dust with talcum powder. Occasionally the powder can be omitted and olive oil used to gently bathe the skin surface. The whole dressing should be continuously heated by hot water bottles so adjusted as to bear no weight upon the part. The temperature of the dressing should be evenly maintained at 110° to 115°, day and night. Once each twenty-four hours all the dressing should be carefully removed and the member inspected.

Now and then we meet a case where ulceration of the skin has occurred over the site of the involved vein. This is brought about in two ways, either by rupture of the vein, or ischemia. In either case hot bichloride of mercury fomentations should be applied and these should be changed frequently in order to be kept moist and hot, preventing adherence of the gauze mesh to the raw area. A week of this treatment will so antisepticize the area that the fomentations can be omitted, the area allowed to dessicate and a dry dusting powder applied. When treating these cases the warm covering should not be disturbed. On the contrary, it should be windowed over the special area to be treated so that ready access to the ulcerated part is obtainable while the dry dressing as a whole is not disturbed. After the dusting powder treatment is begun the ulcerated area should be daily cleansed with sublimate solution, allowed to dry by the influence of the air, and then redusted. The dusting powders giving the best results are oxide of zinc, stearate of zinc (carefully pulverized and not allowed to cake), subgallate of bismuth, and the like. We all have our choice of dusting powders and they each seem to serve their purpose well. Fortunately, ulceration in the acute forms is not frequent.

Fig. 11. The result of puncture of mesenteric vessel with hot needle. Note the firm, hard thrombus continuous with a perivascular clot and the fact that it is not adherent to the intima.

Chronic Cases. Under this head we meet the ambulatory type of cases found in those who do hard labor, requiring much standing. Ordinarily these cases must be treated as office patients and they have to keep on working in order to continue to support their families. Thus we are confronted with a condition which requires careful supervision and explicit, detailed directions. We are dealing with the large, tortuous, superficial veins stagnated by overdistention and lacking proper support.

First of all, we must test the ability of these veins to empty themselves. This is done by having the patient lie down, elevate the lower limb or arm, as the case may be, and by careful digital milking endeavor to empty the tortuous channel. If this procedure succeeds, the case seems more likely to be amenable to a trial without operative procedure, for the time being at least. The patient is then instructed to elevate the disrobed member at an angle of 45° for from ten to thirty minutes daily. He can do this during or following a meal, thus not intruding upon his working hours. A properly outlined or close fitting elastic or linen fiber stocking is to be worn continuously while at work. Whenever the limb be elevated for rest and drainage this stocking should be removed.

The patient should be thoroughly instructed as to the proper care of the skin, which should be bathed thrice daily with an alcoholic solution without using the skin roughly. A soft sponge should be used for this purpose and the skin surface stroked in the direction of the venous flow. After bathing, the skin should be dried by fanning and talcum powder is to be dusted over it. We should always caution the patient against undue roughness and that special care should be taken not to engage in scuffling or lifting heavy weights.

The patient should improvise an inclined plane cradle, properly padded, in which the affected member may rest during the night. Often elevating the foot of the bed eighteen inches will serve the purpose very well; in order to counteract discomfort of the upper body the upper half of the mattress can be propped up with padding or an extra pillow or two provided. In this way the part will be put at complete rest during the sleeping hours and pain, fulness and itching are largely prevented from developing. The stocking should always be removed during sleep, to be reapplied, after properly bathing the part, the first thing in the morning. The patient should be made to understand that this is very important.

When a desirable change of occupation can be made without lowering the income of the patient such a change should be advised. Often such a change as that as will provide the rest portion is beneficial even though the physical labor be quite as hard.

Chronic phlebitis cases are materially benefited by local alternate hot and cold spray, douching, packs or submersions. One of these four methods can be used according to the conveniences of the patient, for they give like results. The submersion and spray combined are often the most convenient and are to be carried out as follows.

Two tubs or pails are used, each containing enough water so that when the affected extremity is submerged, it will cover, if possible, the entire field of tortuous veins. One pail contains water drawn from the cold water tap (or if it be in hot weather a piece of ice should be added in order that the water may be very cold); the other pail contains water at a temperature of 110°. The affected member is first submerged in the hot water and held there thirty seconds. It is then submerged in the cold water for fifteen seconds. This alternating procedure is gone through ten times, ending with the cold water submersion. The part is then gently rubbed until the skin is dry and red, showing proper reaction. Gentle stroke massage in the direction of venous flow is carried out for ten minutes, the skin is dusted with talcum powder and the

Fig. 12. Preparation from case of thrombosis occurring during hernia operation. There is a dense perivascular coagulum and a thrombus is firmly adherent to the intima of the vessel. It is somewhat contracted, due to the reagents used in preparing the section.

member is properly clothed after the elastic support is applied.

Where it is not feasible to use the submersion method, spraying with sponges of hot and cold water, or a nozzle spray attachment serves the purpose very well and is applied for the same length of time. In fact, even when the submersion method is used the spray is often employed to supplement it by treating the upper parts or fields that cannot be submerged.

When none of these methods can be carried out the hot and cold packs for the same periods serve well. Heavy turkish towels are used, wrung out in water of alternating extreme temperatures. The main purpose is to obtain an alternate application of heat and cold extremes for the desired length of time. By such treatment the vasomotor nervous system and sympathetic bloodvessel innervation sys-

tem are greatly augmented so that the musculature of the venous walls are stimulated to action.

It is always wise to caution the patient to dry the skin by gently rubbing in the direction of the venous flow. The tactile and gentle palm pressure stroke following the skin drying should be carried out in the same way. The powder should be gently rubbed into the skin in a like manner after dusting it over the part. The elastic support should then be immediately applied. This régime should be carried out twice daily over a period of say three months.

One other thing to be gained by the alternate thermic applications and elastic support, is to make the deeper venous channels able to care for the superficial congestion. As a result we are better able to recommend the degree of relief which is to be obtained from any surgical procedure that might be advised. If the tortuous superficial veins are emptied to a greater or less degree by this procedure we are fully justified in advising operative methods for complete relief. It is certain that chronic phlebitis cases are aided to a greater degree by operative measures instituted at the proper time. This phase of the subject will be entered into more completely later on.

Chronic phlebitis or varicosity of the abdominal wall or other parts of the body aside from the extremities is best treated so far as alternating thermic reactionary applications are concerned by the spray or packs. The actual nozzle spray serves the best and, in fact, it is very satisfactory in all of these cases. I have used all four of these methods to great advantage in this class of cases.

As has been mentioned before, proper dress for the part is very important and the necessity of properly fitting shoes, sleeves, gloves, socks, etc., should be fully explained. Any of the everyday dress fixtures should be properly fitted and made of good, non-heat conducting material. Rubber heels on the shoes, for instance, will often give much relief in involvement of the lower extremities. Shoes of soft kid, not tightly laced, or corsets properly fitted, are also to be advised, as indicated, so that even pressure is brought to bear upon all surfaces. In fact, the high grade abdominal belts will aid much in giving relief to this portion of the body. Great care should be executed in adjusting such an apparatus, and the corsets should be displaced by such an invention when possible.

When the abdominal wall veins are involved, posture during ten-minute intervals thrice daily aids greatly. This can be done while the alternating thermic reactionary treatment is being applied with the patient lying flat on the back and the hips slightly elevated, supported on a pillow. In these cases the skin should be dried by gently rubbing up on the right side of the abdomen, across the top just below the ribs, down on the left side and then in a circle with the umbilicus as a center. The digital and gentle palm pressure stroke should be carried out in like manner.

One other class of cases might be mentioned under this head, namely, involvement of the hemorrhoidal veins resulting in the condition popularly called piles. This is nothing more or less than phlebitis, in chronic form, of the hemorrhoidal veins. To alleviate this condition general applications of ointments, liquids, medicated enemas, etc., may be tried, but I believe that surgical intervention remains the only true solution to the situation. By

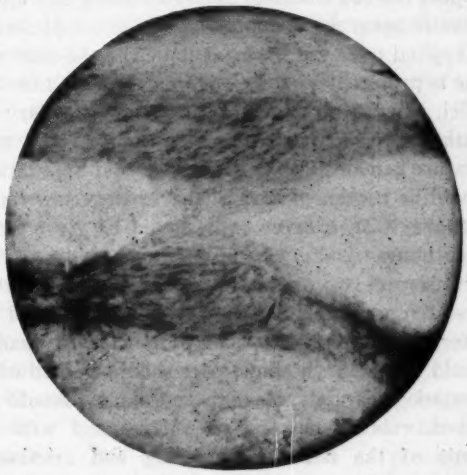

Fig. 13. Femoral vein of dog × 100 to which pressure has been applied with forceps. Three days later the animal was killed, and the preparation shows thickening of the intima and the beginning of adhesions. There is no deposit of corpuscles or diapedesis.

surgical measures properly carried out we obtain permanent relief to the satisfaction of the patient.

DEEP TREATMENT.

Under this head comes the treatment of those cases where the large veins of the broad ligament, the portal system and accessory mesenteric veins, hepatic vein, etc., are involved, the veins draining the viscera of serous cavities. These conditions are most often the result of septic infection or autointoxication if we leave out of consideration those that are the result of cardiac insufficiency or hepatic cirrhosis. In these cases we are treating a condition that calls for absolute rest under the most favorable circumstances. The patient should be kept very quiet in bed, in a room where fresh air and sunshine are plentiful. The bowels must never be allowed to become constipated in the slightest degree.

If the case be one of acute septic infection or auto-intoxication, the diet should be restricted to a marked degree; in fact, I believe that Ochsnerizing these cases gives best results, giving nothing but water in large amounts, hot or cold as desired. This should be followed out for from four days to a week. If the broad ligament veins are involved Fowler's position is to be used, the patient lying flat upon the mattress with the head of the bed elevated for eighteen inches. The foot-board should be placed so that the patient can rest comfortably with the feet against something soft, as a pillow. It is best to keep the patient flat upon her back and caution her not to move much; also the nurse should be especially cautioned not to allow the patient to move hurriedly and that she should not handle the patient except with much care. A cradle should support the bed clothing, thus preventing any undue pressure upon the abdominal wall. Ice caps should be applied over the lower abdomen if the skin surface is protected by some soft material, as a turkish towel, which will act as a pleasant intermediary beneath the cold application. As long as the temperature remains above 100° these cold applications should be continued, but whenever the temperature is above 102°, a fever bath should be given every three hours.

I insist on two or three things in particular when these temperature baths are given; namely, all the water, containing the proper proportion of alcohol, should be at 95°, a single part should be bathed or sponged separately, that is one arm should be bathed, rubbed dry and then frictioned with the palms of the hand; all rubbing and frictioning should be done upward toward the body. After this arm is properly cared for the opposite arm should be treated in the same way and covered. Before another part is bathed, the part just treated should always be covered. Next the face neck and shoulders are bathed in the same manner. Next in order, come the chest, upper back, lower back and abdomen. The back should be rubbed up and down and across between the scapulae. The abdomen should be rubbed very gently in a circular motion, right to left, with the umbilicus as a center, of if it be too tender not bathed at all. Next in order come the lower extremities, which are bathed separately. After the bathing each part, in the order named, should be carefully frictioned with the palms of the hands. This is most important as the superficial circulation becomes increased and the skin flushed. I believe that this increase of superficial circulation has much to do with cooling the body interior by radiation of heat from the body surface. I also believe this lowers the temperature quite as much as the cold bathing and the treatment would not be complete without this increase of superficial circulation. The temperature should be recorded just before and immediately after the bath.

At the end of four days to a week, as the temperature gets to 100° or lower, feeding should be begun, first by giving limited liquids, then gradually increasing in the usual manner. A daily high suds enema should be given throughout the course of the disease and the alimentary tract is to be kept clean. The twenty-four hour amount of urine excreted should be kept and a uranalysis made daily. The patient's bed should never be put down on a level until the temperature has been normal for three days.

Vaginal douches of bichloride of mercury (1-2000) at a temperature of 110°, if given twice daily, aid much in alleviating this condition, and no one thing does more good in phlebitis of the broad ligament. These douches should be continued for one week after the temperature has come down to the normal line and remained there.

Whenever there is membrane left in utero this should be removed with a dull curette while a sharp curette should never be used under any circumstances. After the curettage, a hot intrauterine douche of sterile water (temperature 115°) should be given. Occasionally a boric acid solution may be used, but sterile water serves the purpose quite as well. The intrauterine douche should not be repeated unless there be further evidence of continued absorption. Where such is evident it should be given once daily for a week or so. Convalescence should be very slowly progressive with the patient remaining in bed for three weeks after the temperature has fallen to normal. Slow advancement is to be insisted upon.

When hepatic cirrhosis is the active principle behind the involvement of the veins in the upper abdomen, the usual procedure is gone through for this condition; namely, absolute rest, free diuresis, and diaphoresis, and perfect elimination. Hot packs for thirty minutes twice daily give wonderful results in these conditions. Withdrawal of any of the active etiological factors, such as alcohol, must be insisted upon.

If the heart be at fault and broken compensation be present, the usual cardiac treatment for this condition is to be given; namely, posture, perfect elimination, hot packs and stimulation by the old, well-grounded methods.

None of these acute cases should be allowed to get up too early, but should be kept in bed and a slow and carefully supervised progress should be

insisted upon. Hygiene, diet and advice play their part very strongly under these circumstances. The services of a well-trained and properly fitted nurse should be obtained whenever possible.

MEDICATION.

Internal medication in cases of phlebectasis should always be given for a definite reason based upon sound judgment. On the whole, other therapeutics than drugs seem to give most satisfaction, yet agencies given internally help to a certain degree. If one were to choose between giving up the internal medication or the external treatment, most of us would drop the drugs.

However that may be, certain supports to the general circulation are needed in all cases at certain stages. In the acute cases strychnine, digitalin, tincture of digitalis, whiskey and brandy as cardiac and circulatory stimulants and augmentors are contraindicated in the early stages.

The fewer drugs given internally the better unless absolutely indicated by some variation in the heart action. After the immediate danger of rupture of a bloodvessel, hemorrhage, embolism, etc., are passed, in from seven to ten days, these circulatory augmentors are needed.

Strychnine given in 1/30 gr. doses is the standby for steady support. Brandy and whiskey given in varied, tolerated doses at regular intervals are helpful, while tincture of digitalis or digitalin are occasionally needed. The tincture should not be given in doses over ten minims three or four times a day and the stomach should always be watched for any irritation from this drug. Digitalin, gr. ¼ (Merck), every four hours during the day and if needed at night serves well in many urgent cases. The strychnine and digitalin should be given hypodermatically if indicated by any irritation of the gastric mucosa.

I believe that atropine and nitroglycerine are contraindicated in all cases as no extreme influence long continued, should be brought to bear upon the vasomotor innervation of the vessels, since the fleeting influences intermittent in reaction serve best.

In the cases where affection of the heart or liver is the direct cause diuretics should be given. Potassium citrate, gr. X, well diluted in water, given every four hours, seems to stimulate the kidney cells to free function and is a good drug to use under such circumstances. Tincture of digitalis, assayed and physiologically tested, acts well in this capacity and also regulates the heart rhythm and pulse volume. Pure cold water is possibly our best diuretic after all.

In the chronic phlebitis cases strychnine gr. 1/30 or tincture of nux vomica in ten minim doses four times a day, is nearly always indicated. Thus the venous sluggishness is prevented to a great degree. This class of cases requires systemic tonics in the form of Basham's mixture, Blaud's mass, one or two of the bitter tinctures, as gentian, cinchona or colombo taken well diluted with water a half hour before meals, or, in fact, any of the numerous popular general tonics are indicated during the entire course of treatment. By these the system is kept bolstered up and the appetite remains keen for the proper sort of nourishment. Arsenic in one of its forms seems to do good. Fowler's solution given in two minim doses, well diluted in water, three times a day before meals and increased a minim a day until ten minims three times a day are given, is good routine. Arsenous acid, gr. 1/50, three times a day, in good mixture, serves well. I rely much upon arsenic as a general systemic tonic in these cases.

In the acute cases during convalescence the systemic tonics just mentioned, are indicated. The patient should be built up to the full vigor of health and continue the medication, to a limited degree, for some time, possibly three months. For the bowels the cathartic best tolerated is the one to use.

Other drugs than those mentioned seem superfluous. It is useless to overload the system with medicine and only one or two, or at the most three of these drugs, need be given over any one period of time. Generally one or two drugs given under proper guidance will do quite as well. A good rule to follow is not to give any except those that are indicated. The field of usefulness of potassium iodide is very limited except in the syphilitic cases. In these cases it does serve well, given alternately with some form of mercury. Salvarsan has seemed to do good in a limited number of cases of luetic origin. We can not promise too much from its use, however.

OPERATIVE TREATMENT.

Acute Cases. Surgical intervention is very limited in its field of usefulness in this class of cases. As a rule it is very wrong to interfere surgically. However, in cases of suppurative phlebitis, when definite abscess formation is present, to drain the field about the vein does good. When such a method is instituted the drainage should be continued for a long time, in fact until the bottom of the drained field is absolutely dry and free from pus, and granulations are healthy, bleeding and active.

In my opinion the hepatic cirrhotic cases are not greatly benefited by the operation to short cut the

circulation by attaching the mesentery to the anterior abdominal wall by intermediate method. This may have succeeded in the hands of some operators, yet so far as phlebectasis is concerned its field of usefulness is narrow.

Occasionally gall-bladder disease, inflammation of the bile ducts or acute pancreatitis, will bring on a limited phlebectasis about the source of trouble. This condition does demand surgical intervention. Drainage of the gall-bladder, ducts or both, is indicated and should be performed under such circumstances.

Chronic Cases. Under this heading the superficially involved cases are the ones that derive most benefit from surgical intervention. It is in those cases that have markedly tortuous veins of the abdominal wall, lower extremities, etc., that yield satisfactorily to surgical procedure. The abdominal wall phlebitis is best treated by the intermittent ligation and partial resection operation. Here and there the veins are cut down upon and ligated. This is done at various points over the entire field, the incisions being long enough to produce a fair scar. The contraction of the scar tissue aids much in giving satisfactory results. Occasionally the vein itself is completely resected for a distance of from two to four inches. Giving time for proper healing following this operation, the results are generally good. It is often wise to have the patient wear a properly fitting belt for some time following convalescence.

Tortuous veins involving the lower extremities are best treated by the internal stripping method. This operation, described below, I devised from the idea suggested by the Mayo external stripping operation. I have used this technic with satisfaction in a number of cases for the past few years.

OPERATIVE TECHNIC.

In the surgical treatment of varicosity the technic that is best systematized will yield the most pleasing results. To be sure, this is true in all fields of surgery, yet too much care can not be taken when stripping a vein.

First, perfect asepsis is essential at all times.

Second, the point of incision should be carefully selected. In stripping the long saphenous vein four skin incisions are generally needed. The four points selected for these incisions are: (1) about one inch below the saphenous opening on the anterior, internal surface of the thigh; (2) about one inch above the internal condyle of the femur on the internal, anterior surface of the knee; (3) one inch below the head of the tibia on the internal surface of the leg; (4) two inches above the internal malleolus on the internal, anterior surface of the leg. If it be remembered that the long saphenous vein can be easily found beneath a line drawn in such a way as to equally divide the internal surface of the thigh and leg, it will never be hard to locate this vein. The only deviations are where it arches outward just below the saphenous opening and posteriorly at the knee, as it passes behind the internal condyle.

Third, the separate incisions need never be more than two inches in length, while in depth they need but pass through the integument.

Fourth, the vein is best stripped by the internal or lumen method, thus leaving the adjacent nerves intact.

Author's Description of Modified Instrument, With Technic of Its Use. The instrument (fig. 7) is about two feet in length and easily bent to accommodate all conditions. *A* represents the shoulder about which the vein is tied. That part of the instrument between *A* and *B* remains outside the lumen of the vein. *C* represents that portion of the instrument which enters the vein first. It is also the point wherefrom to exert traction.

A No. 4 copper wire two feet in length is selected. At one end this wire is looped in such a manner as to produce a somewhat prominent shoulder. (See illustration.) This wire can easily be bent to fit all curves and accommodate circumstances. If desired, a properly plated instrument can be obtained from instrument dealers. The incision below the saphenous opening and that just above the internal condyle are made, the vein dissected out at these points, and raised, for convenience, by passing a director beneath it.

A No. 2 chromic catgut ligature is then used to tie off the vein at these two points. A minute longitudinal incision is then made in the wall of the vein exposed through the upper incision and the unlooped end of the wire passed through the upper incision, down through the lumen of the vein to the lower skin incision. Here another minute incision is made in the venous wall through which the wire is allowed to emerge. This wire is drawn down through the vein until the shoulder of the loop just enters the lumen at the upper incision, while the loop itself is not drawn into the vein. A No. 2 chromic catgut suture is then made to encircle the vein at the upper incision and tied tightly about the shoulder of the loop. All free catgut is then cut close to the knots and the vein is cut loose at the point of both incisions, leaving it free between them. The lower end of the wire is then grasped

and by gentle, steady traction the upper division of the vein is stripped away.

By this method the vein is not turned wrong-side out during the stripping, but, rather, the shoulder of the loop causes it to double upon itself, and as a result the vein is not torn or injured in the slightest. The stripping should always be done from above downwards, as all tributaries enter the saphenous vein at an acute angle with the apex pointing the way the stream flows. Thus when traction is made downward these tributaries are separated from the main vein at an angle opposite the direction of the blood stream. In this way these tributaries are occluded and subcutaneous hemorrhage is prevented. After the vein has been stripped it can be uncurled from the loop and examined to insure complete removal. The catgut ligatures should be left long and anchored until the occluded portion of the vein has been stripped, when they can be cut and the raw ends allowed to retract.

After the upper division of the saphenous vein has been treated, the portion below the knee is stripped in the same manner from above downward. The little free blood which may have escaped into the tract is gently squeezed out and the incision is closed with silkworm gut. No drainage is needed. The skin is cleaned, the wound covered with gauze and a fairly snug bandage applied, extending from the foot to the hip.

Post-operative Observations. Very little pain is experienced if the limb is allowed to rest gently upon an inclined plane. A cradle supports the bed clothing and the part is put at complete rest. Two dressings are made during the first eight days and the silkworm gut stitches are removed at the end of this time. The limb is kept well elevated for three weeks. After this period the part is brought into use very gradually.

When the patient begins to walk he should be instructed to move slowly and to rest often. When resting the limb should be kept elevated.

At the end of four weeks, massage is instituted, the limb being rubbed upward for its full length, twice daily. This treatment is continued for two months, during which time strychnine is given in the usual dose and general hygienic and tonic principles are instituted. Swelling rarely occurs if these instructions are carefully followed. The patient can return to his usual vocation in four weeks.

The advantages of the method are sixfold:

1. The nerve which accompanies the vein is not irritated, and thus there is no post-operative pain.
2. There is very little hemorrhage.
3. By using the wire loop and shoulder the vein curls upon a space of one and one-half inches. There is no danger of tearing the vein; the tributaries are occluded when separation occurs; and all bungling work is eliminated. The vein can be uncurled from the loop and carefully examined.
4. The tributaries are torn away at an angle to the main channel, crushing the separated raw ends and leaving them fairly well ligated by this traumatism.
5. In stripping the vein by this method the tributaries are torn and not cut. The extra incisions at times needed in other methods are not called for here, and there is no hunting for the broken end of the main vein.
6. The small incisions leave very little scars after a proper length of time.

For the microphotographs in this article I am indebted to my friend, Dr. N. S. Chapman, who has prepared them for me in connection with his experimental work for the Fiske Fund Essay No. LV.

REFERENCES.

MALL—Archiv. f. Physiologie, p. 409-1892.
ROY & SHERRINGTON, Journal of Physiology, 11-85, 1890.
BANCROFT, American Journal of Physiology, 1,477, 1898.
MACKENZIE, The Study of the Pulse, 1902, American Journal of Medical Sciences. Also Morrow, British Medical Journal, 1906 and 1907.
OSLER—Practice of Medicine.
JOHN W. H. EYRE, Index of Differential Diagnosis, Wm. Wood & Co.
KEEN'S System of Surgery.
967 Elm Street.

MASSAGE IN FRACTURES.

Every medical man who undertakes the treatment of fractures, dislocations and kindred injuries is now expected to understand when massage is required and be ready to apply it personally without grudging the time exacted.—J. J. CLARKE in the *Universal Medical Record.*

CHRONIC PROSTATITIS.

In forty-six cases of chronic prostatitis of gonococcal origin the gonococcus was isolated but five times and was seen on stained slides but nine times. From a public health standpoint such cases are of the greatest importance. It has been demonstrated many times that the accessory bacteria may be present in such abundance that although gonococci are present they are demonstrable only by repeated examination and by special methods. Unless the examination has been made at least three times and at least once by the provocative method no case of chronic prostatitis or posterior urethritis should be released as non-infectious.—A. P. HITCHENS and C. P. BROWN in the *American Journal of Public Health.*

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WALTER M. BRICKNER, M.D., Editor

NEW YORK, APRIL, 1914.

RECURRENCE OF SYMPTOMS AFTER OPERATIONS FOR PYLORIC ULCERS.

The operative treatment of pyloric and duodenal ulcers forms a brilliant but by no means finished chapter in medical progress. (We say "medical" for the internist has contributed to it no less enthusiastically than the surgeon.) The indications for operation are fairly generally established, and concerning the type of operation to be applied there is considerable and increasing accord, but by no means unanimity. In the secondary, but also very important aspects of the operation there is very much that is still unsettled. Leaving out of consideration, for the time being, the location and method of performing a gastro-jejunal anastomosis, the indications for, and value of the procedures of excising and "infolding" an ulcer, are, we think, still quite unestablished.

It is striking to observe that in many cases gastro-jejunostomy gives immediate relief of the distressing pains and discomforts of a pyloric or duodenal ulcer, even before the patient resumes eating, a relief perhaps afforded by the mixture of the alkaline intestinal secretions with the acid gastric juice, although this simple explanation has not been proven. That the relief does not always continue indefinitely, that often all the ulcer symptoms return after a greater or shorter period following a well-performed gastro-enterostomy, has stimulated a study of the factors that underly the failure of this procedure to cure all cases.

Applying to ulcer of the pylorus and duodenum the same principles that govern the treatment of analogous intestinal lesions, it has been fairly accepted that the mere establishment of another gateway for the food is not, in itself regularly sufficient to entirely sidetrack that food from its normal outlet; and that, therefore, something more must be done to shut off the ulcer from the food track. To accomplish this, von Eiselsberg added to the gastro-jejunostomy the device of unilateral exclusion by cutting through the pylorus and closing both ends with sutures. This is a rational, elegant and altogether surgical procedure, but in the often emaciated, hemorrhage-weakened patient, the added shock of manipulation and the increased time of narcosis which it entails, decidedly increase the operative risk. Berg, of New York, was, we believe, the first to employ the much simpler expedient of applying a stout silk puckering suture about the pyloric region, proximal to the ulcer, tight enough to close the channel, but not tight enough to cause necrosis. Lambotte has employed a twine ligature in a similar fashion. Various surgeons, however, assert that silk and twine ligatures, and the silver wire constrictor employed by Fowler, eventually ulcerate into the stomach and the opening becomes re-established. Whether this is an inherent objection to foreign substances thus employed, or whether such an outcome proceeds from faulty technic in their application, we do not know. Berg has been satisfied with his results, and he has demonstrated the silk thread in place, and the pylorus well-blocked, long after the operation. To escape from the use of a foreign-body constrictor, Wilms recently introduced the employment of a strip cut from the sheath of the rectus abdominis, tied twice around the pylorus. Charles Mayo has also employed a strip of tissue, which, however, he takes from the gastro-hepatic or greater omentum, leaving it still attached at its gastric end, and further diminishing in size the site of blocking "by the application of several interrupted sutures of fine silk to take the strain during the healing process."* Whether living tissue, thus used, possesses more than a theoretical advantage over the silk thread, it is too early to assert.

That the practice of "pyloric exclusion" has greatly reduced the number of recurrences it is now safe to say. But the statement that has been made, that gastro-enterostomy will *always* fail to cure pyloric or duodenal ulcer if the outlet is not pathologically or artificially occluded, is not substantiated by clinical observation nor bismuth-*x*-ray studies. Nor is it true, as has also been claimed, that a gastro-

jejunostomy will always eventually close if the pylorus is not blocked.

Granting, however (for exceptional cases do not disprove its rationale), the importance of pyloric exclusion (by whatever method experience establishes as best), as a part of the operation for pyloric and duodenal ulcer, several questions remain to be answered:

Is it wise to apply artificial exclusion only to those cases for which it has been recommended, viz., those in which the pyloric outlet is not already pathologically occluded? In some of the cases in which there is obstruction by an ulcer mass does not the gastro-enterostomy allow the mass to shrink sufficiently to reopen the pyloric outlet, and thus revive the ulcer irritation? It seems reasonable to assume such a "vicious circle."

Even though the food be side-tracked and the pylorus blocked, how much are reduced the peristaltic contractions at the ulcer site, how regularly is spasm obviated?

How often may an ulcer left in situ, albeit side-tracked and occluded, continue to give symptoms by reason of its very presence? How often may such ulcers refuse to heal?

We can probably better answer these questions when there has been discovered the etiology of these ulcers, which also may revolutionize their treatment.

It must be remembered, of course, that the cause of the recurrence of gastric symptoms after ulcer operations, does not always lie at the ulcer site. It arises also, sometimes, from a variety of mechanical faults following gastro-enterostomy, but far less frequently than in the days when that operation was a complicated procedure elaborated to avoid the dreaded "vicious circle."

Some time ago Wm. Mayo called attention to the development of a gastro-jejunal ulcer at the site of anastomosis, and in a recent article* he again records it, and some related local faults, as the occasional causes of "recurrences" in these cases. He attributes these ulcers to irritation by a silk suture which may remain hanging in the wound for a very long time. He therefore advises "that very fine silk, not heavier than 0, should be used for gastro-jejunostomy, that the bite of the sutures should be as near the margin of the incision as possible and that, if it is necessary to reinforce a weak suture line, interrupted fine silk sutures are advisable or such sutures used for part or the whole of the outer row. It has been our practice for a long time to use catgut for the inner row, but it is not the inner row that gives trouble. It is the outer or musculo-peritoneal suture, and I have no doubt that if the order were reversed, using silk or linen for the inner row and catgut for the outer, better results would follow. However, catgut is so good a culture medium that one hesitates to use it on the peritoneal surface of a necessarily infected wound."

Anent another cause of failure, he says: "If the margins of the opening in the transverse mesocolon contain fatty tissue, it should be sutured to the stomach rather than to the gastrojejunal suture line. Otherwise, it may form a collar-like mass constricting the opening."

Concerning such mechanical conditions as these it must be remarked that, while the operation of gastro-enterostomy is fairly standardized, surgeons differ so much in small, but important details, that each must study his failures in the light of his own methods.—W. M. B.

* Wm. J. Mayo—Recurrences of Ulcer of the Duodenum following Operation, Boston Medical and Surgical Journal, January 29, 1914.

CONSERVATION OF THE INTERCOSTAL NERVES IN CELIOTOMIES.

In an earlier editorial (February, 1912), we noted the unwisdom of abdominal incisions through the linea alba, since the union of the single layer of fused fasciæ and peritoneum in the midline is often insufficiently strong to prevent the development of post-operative herniæ, especially after hypogastric laparotomies on women who have borne children; and we urged the advisability, therefore, of dividing the abdominal wall to one or the other side of the midline, *i. e.*, vertically through the rectus abdominis sheath, which is, indeed, the routine practice of many surgeons.

This vertical incision through the rectus sheath, unless short, is apt, however, to expose one or more branches of the intercostal nerves and ilio-hypogastric nerve coursing transversely under the rectus muscle, and division of such a nerve probably enervates more or less of that portion of the muscle mesial to the incision. When this is not a wide portion the functional impairment is, as far as we have noted, negligible. Nevertheless, the possibilities of mischief from distruction of these nerves is evident, on a large scale, in the extensive pseudo-hernia that follows inadvertent division of the ilio-hypogastric trunk in lumbar operations.

For the full preservation of muscle function, therefore, it is advisable to avoid injury to these intercostal nerves in abdominal sections. Another reason is provided, from the experimental side, in the interesting study by E. P. Quain, published in this issue of the JOURNAL. His animal experiments indicate that "if a peritoneal surface deprived of its

intercostal nerve supply be subjected to a trauma, or to a trauma plus infection or irritation, such as may obtain during an operation, more adhesions and a more chronic infiltration of the peritoneum is likely to follow than if the same injuries were inflicted on a peritoneum with normal nerve supply." Nor does his demonstration lose force from the fact that in his experiments he enervated a much wider area of peritoneum than would suffer from division of an intercostal nerve in the rectus sheath. We regret that he did not add to his interesting study observations of the effect of the various nerve divisions upon the muscles themselves.

Quain states that enervation of the parietal peritoneum by injury to an intercostal nerve "will add another strong argument in favor of transverse abdominal incision." We do not think, however, that it is a controlling argument in favor of such an incision, although it may be true that the divided rectus may be reunited without loss of strength or function. But it does add another strong argument in favor of conservation of the intercostal nerves in abdominal section; and this can, and should be, accomplished even in long vertical incisions, either by care in avoiding injury to a nerve allowed to remain stretching across the wound or by gently retracting it to or towards the wound angles, to which latter procedure it yields surprisingly. There are few intra-abdominal procedures that cannot be carried out through a vertical rectus sheath incision, and that without dividing the nerves; and we believe, too, that the instances are relatively few, even in such deep-seated manipulations as are involved in operations on the common bile duct, in which this vertical muscle-splitting (or retracting) incision need be complicated by transverse or oblique division of the rectus fibers.—W. M. B.

Surgical Suggestions

Vulvar verruccae, appearing suddenly without any ascertainable cause, are sometimes associated with a malignant growth in the uterus.

Nocturnal pruritus ani is often prevented, even cured, by inserting a fair-sized hard rubber or metal dilator into the anus for about fifteen minutes at bedtime.

In determining whether or not a female has been infected with gonorrhea, withhold definite conclusions if there are no early evidences. The first manifestation may be a salpingitis several weeks after the suspicious intercourse.

Surgical Sociology

Ira S. Wile, M. D., Department Editor.

THE PHYSICAL EXAMINATION OF RAILROAD EMPLOYEES.

In the general campaign for the prevention of accidents, great stress has been placed upon various educational measures. Industrial organizations have of their own initiative established schools for employees with a view to securing greater proficiency together with increasing safety. The protection of the American laborer involves the protection of the community, insofar as negligence may endanger human lives, particularly where transportation facilities are concerned. It repeatedly has been pointed out that the Government requires a careful physical examination of all candidates for the army and navy and rejects those physically unfit, even though the unfitness be of such relatively minor character as hernia, flat-feet and defective vision.

It would seem obvious that the railroads should endeavor to secure a higher plane of physical efficiency in their employees. It would not be exceedingly expensive to organize a plan for the systematic physical examination of railway employees with a view to eliminating at the outset, those physically unfit for public service.

According to the figures of the Interstate Commerce Commission, sixty-five to seventy per cent. of the accidents reported by railway officials are due to the carelessness of employees. The competence of many of the employees is limited by their physical defects. Safety in transportation is fundamentally dependent upon the physical and the mental competence of railway employees. The senses of sight and hearing, together with mental acuity and moral worth are essential to secure the reduction of railway accidents to an irreducible minimum.

Under the maritime laws, an examination and license of crews is mandatory. There appears to be little reason why a similar regulation should not be exacted from those responsible for transportation on land. The enactment of legislation that will secure the physical examination of railway employees, particularly engineers, firemen, conductors, brakemen, and switchmen will redound to the advantage of the public, the railroads, and the employees. Fully two million men are engaged in the railway services of this country. To base their employment upon physical competency would largely guarantee safe transportation in a more effective manner than is possible at the present time. Numerous railroads train their employees in the physical care of equipment and give more or less adequate training in the handling of rolling stock. Few, however, have appreciated the importance of giving thorough instruction to the employees in the responsibility of caring for themselves and of maintaining health upon a plane that will minimize the

human hazard that arises from preventable causes. Railway efficiency demands efficient workmen and of this railroads can be certain only through the institution of medical inspection as part of the routine of industrial organization.

THE REGULATION OF MIDWIVES.

The status of American obstetrics leaves much to be desired. Laying aside the responsibility of medical colleges for their failure to give adequate obstetrical training, one is confronted with the great problems of midwifery as it exists today. At the present time, practically forty per cent. of the women of this country are cared for by midwives. Recognizing this fact, is it desirable that midwives should be permitted to practice without regulation, supervision or control? The general attitude towards midwives has been one of toleration, indifference or neglect. In only six states is there a requirement that midwives shall be trained before receiving a license. Virtually, there is but one school for midwives maintaining high standards and that is the one established in connection with the Bellevue Training School which presents a six months' course for fifty pupils.

A study of the history of the midwives in England together with the workings of the Midwives' Act of 1902, as described in Bulletin 13, issued by the New York Committee for the Prevention of Blindness, indicates that the training and licensing of midwives has been successful. Under the jurisdiction of a Central Midwives' Board, a minimum standard has been established for all registered training schools to which instructors must conform. As a result of the careful and diligent supervision of inspectors, the maternal mortality from parturition has decreased; the infant mortality has been lessened; and blindness of the new born minimized. Obstetrical patients among the poor receive better instruction, more efficient nursing, and far more adequate obstetrical care. Inasmuch as the midwife is restricted to the care of normal cases of labor, there has been an increase in the amount of medical attention given to the poor. About fifteen per cent. of cases employing midwives have required the services of doctors.

Opposition to midwives has been based upon the false assumption that medical men are fully prepared to give the highest grade of treatment to all lying-in women. It is regrettable that the records of cases of puerperal sepsis and ophthalmia neonatorum evidence the fact that the proportion of these diseases appears to be greater in the practice of physicians than in that of midwives.

In the light of our present immigration and the character of the midwifery services that are available, it would seem more rational to raise the standards for all engaged in obstetrical work. Physicians need better training; a wider extension of the facilities of lying-in hospitals is necessary; the midwives require schools for their training, together with municipal control and state or municipal licensure. The problem is not to be solved by indifference or neglect. Recognizing present needs, the potential mothers of the community deserve protection and the forty per cent. of childbirths that are in the hands of midwives calls for more active attention on the part of the community. There is a vital problem that must be solved, in order to establish midwives as cleanly, useful and co-operating social and obstetric agencies.

A SKULL AND CROSSBONES-SHAPED POISON TABLET WITH RESIDUAL "BONES."

JOHN NEELY RHOADS, M.D.,
PHILADELPHIA.

What surgeon has not asked the nurse time and again, "which is the mercury solution?" What surgeon has not put his keen edged knives into an unsuspected corrosive sublimate solution? I advocate that mercury and all other poison tablets be made in a certain form by all manufacturers. Furthermore, I would urge that poison tablets be doubly safeguarded by having glass crossbones in the middle of them. When a nurse drops such a tablet, say a "death's head" of mercury, into a vessel of water for use at an operation, both she and the surgeon will know after it has disolved what the solution is, because of the tell-tale "bones."

It is a fact that corrosive sublimate tablets when sold by retail druggists are always put up in containers which have been carefully labeled with skull and crossbones labels, but the label on the container is no help in the dark. I know, too, that some druggists always put such tablets into peculiarly shaped bottles, and that some even use bottles that are covered with sharp spikes, still these accident poison cases continue to multiply. As nearly all the accidental poison cases occur at night it is necessary to have some warning device which will be serviceable day or night.

I know of one firm who advertises that they make diamond-shaped tablets of mercury. Other firms make tablets to be taken internally that are diamond shaped, and I have often seen candy tablets of the same shape. I know of another firm who makes poison tablets triangular shaped, and still another firm makes them in the shape of a coffin. I feel that all mercury tablets, if not all poison tablets, should be made in the same shape.

If it is finally settled that the shape shall be the horror-giving classical skull and crossbones, then let us go further and make the death's head nearly or quite unswallowable by superimposing it with glass "bones." The skull and crossbones-shaped tablet need not be so classical as to make the tablet too fragile, but should be somewhat spread out and flattened.

If the coffin-shaped tablet should be chosen as the best shape for warning and for utility, then let it be superimposed with "glass nails," so that it, too, would be rendered practically unswallowable, as well as to have a residual marking for the poison solution.

I would suggest that the tablets be made by the moulding process and not by the compressed tablet process. Of course the moulding board would have to be overhauled and so constructed that the "condyles or nail" heads would extend beyond the tab-

lets. To be sure, the unswallowableness of the tablet would be governed by the length of the "bones" or "nails." The "nails " or "crossbones" should have cast upon them the strength of the tablet in order that a surgeon might not only know that a given solution is a mercury solution, but also that it is a mercury solution of a certain strength.

Finally, I advocate that all poison tablets in this country and in foreign countries be made *in one specific shape.* I would urge the U. S. Government to insist that all manufacturers of poison tablets make them in the same shape. Furthermore, I would ask that they forbid candy manufacturers to make candy or cough drops in any similar shape. Thus, I would have the poison tablet placed in a class entirely by itself.

Book Reviews

The Pathology of Growth-Tumors. By CHARLES POWELL WHITE, M.D., F.R.C.S., Director Pilkington Cancer Research Fund; Pathologist, Chrisel Hospital, Manchester; Special Lecturer in Pathology, University of Manchester. Octavo; 235 pages; illustrated. New York: PAUL B. HOEBER, 1913.

Over half of the text is devoted to the gross and histological features of the various types of blastomata; the remaining portions discuss the origin, life history, physiological and biological aspects and growth of tumors. The work is written in a didactic form and reflects the author's views exclusively. Indeed the book does not contain a single reference to any other author. The histological descriptions are rather brief and differ in nowise from those found in the conventional text-book. The discussion of the broader phases of tumor growth displays a wide knowledge of the subject. In general the author's views are those currently held by most pathologists. The only instance where the author reveals a divergence from the modern trend of medical thought is in his maintenance of hypernephroma as adrenal in origin. The illustrations are nearly all excellent photomicrographs.

Practical Sanitation: A Handbook for Health Officers and Practitioners of Medicine. By FLETCHER GARDNER, M.D., Captain, Medical Corps, Indiana National Guard; Health Commissioner of Monroe County, Indiana; and JAMES PERSONS SIMONDS, B.A., M.D., Professor of Preventive Medicine and Bacteriology, Medical Department, University of Texas; Lately Superintendent, Indiana State Laboratory of Hygiene. Octavo; 403 pages; illustrated. St. Louis: C. V. MOSBY COMPANY, 1914. Price $4.00.

At the present time, when the science of practical sanitation is becoming so very important, a book such as this is of considerable usefulness. It endeavors to set before the reader the facts most necessary to a clear understanding of modern sanitary science. In a work of four hundred pages it is obviously impossible to more than outline the main points when such varied subjects are considered as epidemiology, including the management of epidemics, isolation, quarantine and disinfection; an account of each of the infectious diseases; a section on general sanitation, including statistical methods, school and factory inspection, sewage and garbage disposal.

In spite of this wide range of subjects, the material is treated in so terse a manner that a very large amount of information is placed at the reader's disposal. This book will undoubtedly be found of great use to the health officer, especially one who is so situated that reference libraries are not at his command. It is furnished with a very complete index.

Infections of the Hand. A Guide to the Surgical Treatment of Acute and Chronic Suppurative Processes in the Fingers, Hand and Forearm. By ALLEN B. KANAVEL, M.D., Assistant Professor of Surgery, Northwestern University Medical School, Chicago. *Second edition.* Octavo; 463 pages; 147 illustrations. Philadelphia and New York: LEA & FEBIGER, 1914. Price, $3.75, net.

We sufficiently indicated in the review of its first edition, two years ago, the excellence and the general character of this unique monograph based on painstaking anatomical, experimental and clinical studies. Nothing has been added in the past two years to the pathology or the surgery of hand infections, and so thorough a work as this offered little room for alterations or additions. Nevertheless, it has been submitted by its author to a general revision. To several chapters résumés have been appended for hasty reference. About a dozen new illustrations have been introduced, and the legends under some of them have been amplified. The actual increase in the size of the book is about 20 pages.

We warmly commend a careful study of this work to every physician who undertakes the treatment of even the apparently trivial forms of infections of the fingers and hand.

Practical Prescribing With Clinic Notes. By ARTHUR H. PRICHARD, M.R.C.S., L.R.C.P., R.N. (Rtd.), Late House Surgeon, the Brompton Hospital, and Resident Surgeon, R. N. Hospital, Gosport. Octavo; 207 pages. London: HENRY FROWDE and HODDER & STOUGHTON, 1913. Price $2.00.

The author in this book presents typical histories and descriptions of various diseases and then gives a detailed account of their treatment. The prescriptions used are printed in one column, while parallel to this are given the course of the illness and the various measures used in combatting it. The reader thus becomes acquainted with many various methods of caring for the same disease, as the course of each illness is given in detail and different remedies are applied on different days. Following the description of each illness is a short résumé of the pharmacological action of the drugs used, and the reasons for their employment.

The book may be recommended as a very practical one and one from which the reader may gain many helpful suggestions as to treatment.

Studies Concerning Glycosuria and Diabetes. By FREDERICK M. ALLEN, A.B., M.D. Large octavo; 1179 pages. Boston: HARVARD UNIVERSITY PRESS, 1913.

In this truly monumental work the author contributes his experimental studies on various phases of the subject which were carried out during a period of three years in the Harvard Medical School. Each study is accompanied by a thorough critique of the literature. Inasmuch as the author's researches concern nearly every phase of glycosuria and diabetes, the book forms a reference work of the very first order. As such it should be the fountainhead for most subsequent researches upon diabetes for many years to come. The value of the work is enhanced by seventy pages of bibliography. Unfortunately, there is no index.

The Practitioner's Practical Prescriber and Epitome of Symptomatic Treatment. By D. M. MACDONALD, M.D., Medical Officer of Health, Leven, Fife. 198 pages. London: HENRY FROWDE and HODDER & STOUGHTON, 1913. Price $1.50.

This little pocket edition, besides containing tables of dosage, is chiefly made up of an alphabetically arranged list of diseases with brief suggestions as to their treatment. Naturally not very much information can be imparted when subjects are so briefly considered that the treatment of cholecystitis is given in four lines—that of cirrhosis of the liver in seven lines, that of endocarditis in a quarter of a page. However, the reader will find enough under each heading to afford a suggestion.

Diseases and Deformities of the Foot. By JOHN JOSEPH NUTT, B.L., M.D., Surgeon-in-Chief, New York State Hospital for the Care of Crippled and Deformed Children; Surgeon, Sea Breeze Hospital; etc., etc. Octavo; 293 pages; illustrated. New York: E. B. TREAT & COMPANY, 1913. Price $2.75.

A survey of this small book does not reveal any information that cannot be derived from larger books devoted to the subject. The author states that "text-books on orthopedic surgery are rarely consulted by the general practitioner," and this thought appears to have guided him in the preparation of his work.

Medical and Surgical Reports of Bellevue and Allied Hospitals in the City of New York. *Volume V*, 1911-12. Edited by A. A. SMITH, M.D.; C. E. NAMMACK, M.D.; VAN H. NORRIE, M.D.; J. A. HARTWELL, M.D.

This volume of 456 pages contains 49 papers from the hands of various members of the medical and surgical staff of these hospitals. All of these articles have been published elsewhere, but it is very desirable that they should be collected in order to see the amount of work produced from this group of institutions.

Diagnostic Methods. By HERBERT THOMAS BROOKS, A.B., M.D., Professor of Pathology, University of Tennessee, Memphis. *Second edition.* 82 pages. St. Louis: C. V. MOSBY COMPANY, 1914. Price $1.00.

As stated in the subtitle, this little book is a guide for history taking, making of routine physical examinations, and the usual laboratory tests necessary for students in clinical pathology, hospital internes and practicing physicians. It will be found especially useful as a handy reference in the clinical laboratory, for the various laboratory tests and reactions are carefully but very briefly described.

Books Received.

The Elements of Homoeopathic Theory, Practice, Materia Medica, Dosage and Pharmacy. Compiled by DRS. F. A. BOERICKE and E. P. ANSHUTZ. *Third, revised edition.* Duodecimo; 223 pages. Philadelphia: BOERICKE AND TAFEL, 1914.

The Anatomist's Notebook. A Guide to the Dissection of the Human Body. By A. MELVILLE PATERSON, M.D., Edin., F.R.C.S., Eng.; Professor of Anatomy in the University of Liverpool, etc. Small octavo; 350 pages; illustrated. London: HENRY FROWDE and HODDER AND STOUGHTON, 1914.

Defective Ocular Movements and Their Diagnosis. By E. and M. LANDOLT (Paris). Translated by ALFRED RAEMMELE, M.B., Ch.B., and ELMORE W. BREWERTON, F.R.C.S. Duodecimo; 99 pages; illustrated. London: OXFORD UNIVERSITY PRESS, 1913. Price $2.00.

The Unexpurgated Case Against Woman Suffrage. By SIR ALMROTH E. WRIGHT, M.D., F.R.S. Duodecimo. New York: PAUL B. HAEBER, 1913. $1.00, net.

Practical Dietetics, with Reference to Diet in Disease. By ALIDA FRANCES PATTEE, late Instructor in Dietetics, Bellevue Training School for Nurses, Bellevue Hospital, New York, etc., etc. *Eighth edition*, revised and enlarged. Duodecimo; 475 pages. Mount Vernon, N. Y. Published by THE AUTHOR, 1914. Price $1.50.

Causes and Cure of Crime. By THOMAS SPEED MOSBY, Member of the American Bar; former Pardon Attorney of the State of Missouri; Member American Institute of Criminal Law and Criminology; Author of "Capital Punishment," "Youthful Criminals," "Alcoholism and Crime," "Mothers of Bad Boys," etc. Small octavo; 354 pages; illustrated. St. Louis: C. V. Mosby Co., 1913. Price $2.00.

Progress in Surgery

A Résumé of Recent Literature.

Free Transplantation of Fascia Lata to Replace Tendons and Ligaments. (*Ueber die Freie Transplantation der Fascia Lata als Ersatz fuer Sehnen und Baender.*) K. GIERTZ, Umea, Sweden. *Deutsche Zeitschrift fuer Chirurgie*, Vol. 125, Parts 5 and 6.

An examination of the literature by Giertz does not reveal any cases that clearly demonstrated the advantages of fascia strips to replace tendons. Kirschner showed that the transplants are successful experimentally, but that they show a tendency to stretch. Isolated reports of partially successful transplants of fascia strips drawn through veins have been made. Giertz presents the details of three cases in which strips of fascia lata were employed to fill in gaps between the two ends of tendons. In one case the gap measured 15 cm. In every instance the result was very satisfactory, even though the dense scar tissue did not offer a very desirable medium for the transplants. The technic was very simple. Strips of fascia lata of the required size were removed, rolled up, and sutured with silk at both ends to the ends of the severed tendon. Early mobilization was practiced. In one instance a defect in an articular ligament was successfully replaced by fascia.

Incidence and Diagnosis of Complicating Factors in Gastric and Duodenal Lesions. EUSTERMAN. *The American Journal of Gastro-Enterology*, January, 1914.

The author has compiled this paper on the basis of 1800 cases operated upon at the Mayo clinic. The following points of interest were noted in this valuable article:

1. In 778 cases of duodenal ulcer, pyloric obstruction was noted in 194 or 26 per cent. In 324 cases of gastric ulcer, obstruction of the pylorus seen in 94 or 29 per cent.

2. Many cases of chronic perforation pursue their course without pain. Acute perforation often simulates acute appendicitis because the escaping fluids gravitate into the right iliac fossa. Perforation is noted in 28 per cent of all duodenal ulcers. Of 216 perforations, 4 were acute, 13 acute "protected," 65 subacute, and 137 chronic perforations.

Of gastric ulcers, 25.3 per cent perforate; of 82 perforations, 20 were subacute and 62 chronic ruptures.

Gastro-enterostomy was performed in practically all cases.

3. Gross hemorrhage from the mouth or bowel was present in 20 per cent of all duodenal ulcers.

Six Cases of Megacolon. BEUSAUDE and SORREL. *Archives des Maladies de l'Appareil Digestif et de la Nutrition*, 1914, VIII, page 1 (January).

Six cases of megacolon are reported, observed clinically, and with complete proctoscopic and radioscopic observations. The results are summarized as follows:

1. Five of the six cases present a valve formation, 13-17 cm. from the anus, visible distinctly with the proctoscope; upon forcing the way past this valve, the proctoscope enters the very much dilated sigmoid. All of the cases presenting this valve formation showed active clinical symptoms of their disease. The sixth case, without this valve arrangement, suffered no evidence of the malady. The valve formation disappears under anesthesia, and is due to a "bend" of the gut at this point.

2. There are three classes differentiated: (a) megacolon with latent symptoms; this class calls for medical treatment only. (b) Megacolon with intestinal symptoms; surgical treatment consisting of ileo-sigmoidostomy is sufficient. (c) Megacolon with intestinal symptoms accompanied by signs of a general intoxication; ileo-sigmoidostomy with resection of the involved intestine is indicated.

Chronic Gastric Ulcer and Its Relation to Gastric Carcinoma. Review of 684 specimens. W. M. MACCARTY and A. C. BRODERS, Rochester, Minn. *Archives of Internal Medicine,* February 15, 1914.

The question as to how frequently carcinoma develops in chronic ulcer of the stomach is obviously unanswerable, according to MacCarty and Broders. All that can be definitely claimed is a rather frequent association of histologically typical carcinoma in gastric ulcers. Of 684 specimens of ulcer excised in the Mayo clinic, 191 were chronic ulcers in which no histologic evidence of carcinoma was present; 472 presented the characteristics of simple ulcer plus the presence of carcinoma; in 21 specimens the presence of cancer was doubtful. The ulcer which contains the smallest amounts of carcinoma contains these in the mucosa of the borders and not in the base. This association should lead the practitioner to suspect malignancy in many clear cases of ulcer of the stomach. The differential diagnosis cannot be made by clinical methods, but only by the pathologist after the ulcer has been excised.

Surgical Treatment (Splenectomy) of Diseases of the Blood. (*Die Blutkrankheiten und Ihre Chirurgische Behandlung* (*Milzetstirpation*).) R. MUEHSAM, Berlin. *Deutsche Medizinische Wochenschrift,* February 19, 1914.

A number of cases operated upon by the author and many others from the literature are analyzed. It is evident that splenectomy can have no effect upon infectious and septic processes in which the enlargement of the spleen is a small part of the general picture. It has no influence upon malaria and is contraindicated in leukemia. On the other hand, a well-timed splenectomy in Banti's disease may be fairly definitely counted upon to result in cure. The latter may obtain even in the third stage of the disease (ascites), when the removal of the spleen is combined with an omentopexy. Seven cases of infantile splenic anemia have been saved by the operation. In a series of cases of hemolytic jaundice, splenectomy appears to have had a very satisfactory outcome. A certain percentage of cases of pernicious anemia are definitely improved by the operation. It is as yet impossible to state in advance which cases will be benefited and for which the operation is of no avail.

Lithiasis of the Branches of the Hepatic Duct. (*La Lithiase des Branches de Bifurcation de l' Hépatique.*) E. QUÉNU and P. MATHIEU, Paris. *Reine de Chirurgie,* February 10, 1914.

This paper represents an effort to draw more widespread attention to a condition which, though not frequently encountered, presents a very difficult problem to the surgeon. After outlining the condition termed intrahepatic lithiasis and referring to an important paper by Beer on that subject, the authors describe minutely three cases of their own and four of Kehr's. In their cases the end result was finally good in all; one patient has remained well for four and a half years. The prognosis of this condition is nevertheless grave, for the lithiasis is generally of very prolonged duration, and recurrences are avoidable only with great difficulty. The authors insist upon the wide drainage of the involved ducts and upon second or even third operations upon manifestations of renewed biliary obstruction when lithiasis of the hepatic ducts coexists with intrahepatic lithiasis, the prognosis is even more grave. Two groups of cases of lithiasis of the ducts are described: one in which the stones are numerous and small; the other, in which the calculi are firmly adherent to the walls of the ducts.

Sulphuric Ether Lavage in Infections. A Preliminary Clinical Report of 30 cases Treated by This Method. G. DE TARNOWSKY, Chicago. *Journal American Medical Association,* January 24, 1914.

In a preliminary clinical report of thirty cases treated by the Souligoux-Morestin method of sulphuric ether lavage of the peritoneal cavity, De Tarnowsky says that his attention was called to the method during a recent visit to the Paris clinics where it is used in five hospitals as a routine measure in all laparotomies. It was his privilege to watch the *modus operandi* and to notice the absence of unfavorable sequels. Eight years' experience with ether as a local disinfectant had convinced him already that it was harmless as regards cell degeneration, and he quotes the French authorities to the same effect. He began using it in his abdominal operations in the latter part of August, 1913, in both private and charity cases with uniformly gratifying results. The technic is described by him as follows: "After removal of pathologic tissue free pus is carefully wiped out; then ether is freely poured into the abdomen and is allowed to come in contact with all of the viscera in a case of general peritonitis. The viscera are literally washed in ether, hence the term 'lavage' adopted by the French. As much as a quart of ether has been thus used. After having remained in contact with the abdominal organs for from two to five minutes, it is mopped out by means of gauze sponges and the abdomen is closed with one small drain. In circumscribed peritonitis the pus cavity, having been wiped out, is filled with ether and the abdomen is closed without drainage. In pelvic peritonitis, ether-soaked sponges are applied to all involved surfaces, and then two ounces of ether are poured into Douglas' pouch and the abdomen is closed without drainage. The immediate effect of ether, thus applied, is to cause a momentary capillary contraction followed by a hyperemia of the viscera. There is a moderate formation of carbon dioxid in the abdomen, evinced by a bubbling sound and the escape of bubbles from the surface of the ether. Ether is slowly absorbed by the serosa; this is proved by the fact that no change in the anesthesia of the patient has been reported to date." De Tarnowsky's thirty cases included three cases of gangrenous appendicitis with general peritonitis, four cases of localized abdominal peritonitis, two of pelvic peritonitis, and one of acute cholecystitis with adhesions in which the bactericidal action was very apparent. The remaining cases were not acutely septic. In 75 per cent the postoperative pain and restlessness were lessened and were not increased in the remaining 25 per cent. He is convinced that there is less pain than there is ordinarily encountered, and there was no mortality in this series. Experimental study on animals is being carried on by Dr. Bissel in the Cook County Hospital and will be reported later.

Laryngectomy With Associated Gastrostomy. (*Laryngektomie mit Beigefügter Gastrostomie.*) F. TOREK, New York. *Zentralblatt für Chirurgie,* December 27, 1913.

Torek calls attention to the difficulty in feeding patients after total laryngectomy. The usual method, *i. e.,* by a tube passed into the esophagus, is attended by the great danger of infection of the wound. In order to obviate this, Torek recommends that at the completion of the laryngectomy (which can be done under a local anesthesia) a gastrostomy according to the method of Witzel be performed. In one case in which this procedure was done, the post-operative healing of the laryngectomy wound was unusually free from the complications of infection.

Autogenous Vaccine in the Treatment of Hay Fever. P. M. FARRINGTON. *The Laryngoscope,* January, 1914.

The author injects a vaccine prepared from a film of secretion from along the middle turbinates transferred to agar tubes. An average of two hundred million bacteria were given every fourth day for nine injections. The results were as follows: Out of the twenty-five patients treated, thirteen were cured, six markedly improved, three slightly improved, and three failures. Of the thirteen patients cured, eight had asthma as a complication; of the six markedly improved, five had asthma.

On the Use of Electro-magnets in the Extraction of Metallic Bodies From the Trachea and Bronchi, With Report of Cases. SAMUEL IGLAUER. *The Laryngoscope,* January, 1914.

In the literature eleven cases are recorded in which extraction by electro-magnets was undertaken. Seven of these cases were successful. A review of the recorded clinical cases, as well as of the writer's, leads to the conclusion that in exceptional instances the electro-magnet may prove of great value in the extraction of foreign

bodies from the lungs. These cases would be limited to that group in which the foreign body was beyond the reach of a bronchoscope or was concealed in profuse secretions. The magnet may also attract the foreign body and thereby shorten the search when an external operation becomes necessary. In the vast majority of instances, however, the bronchoscope will remain the instrument of choice.

Acute Phlegmonous Epiglottiditis. M. D. LEDERMAN. *The Laryngoscope,* January, 1914.

This condition is an infectious process involving the submucous structures of the epiglottis and contiguous tissues. In the four cases which came under the writer's observation suppuration accompanied the inflammatory syndrome. The disease is characterized by a sudden onset with distinct local manifestations. There is usually a sharp pain in the throat accompanied by painful deglutition and a sense of fulness or obstruction in this region. The voice is distinct and guttural. These symptoms rapidly progress and may assume a serious aspect in a few hours. At times the attack is ushered in with a chill, followed by a rise of temperature. Examination shows an enormously swollen epiglottis, sometimes three or four times its natural size.

Operative Technique for Conservation of the Superior (Fronto-Palpebral) Branches of the Facial Nerve in Total Extirpation of the Non-Cancerous Parotid. (*Conservation des Rameaux Supérieurs (Fronto-Palpébraux) du Facial dans l'Extirpation Totale de la Parotide en Dehors du Cancer Technique Opératoire.*) P. DUVAL, *Revue de Chirurgie,* February 10, 1914.

One of the early symptoms of cancer of the parotid is the involvement of the facial nerve, and the author therefore does not plan his procedure for carcinoma of the gland. However, it is now well established that radical removal is often indicated for "mixed" tumors of the parotid as well as for frankly benign ones. Intraglandular enucleation has been the rule, because of the fear of injuring the facial nerve; recurrences have frequently followed this procedure. The author's plan is a radical extirpation combined with the sacrifice of the lower branches of the facial nerve and the conservation of the upper. He believes that injury of the facial is of great significance only when the upper branches are affected.

The facial nerve penetrates the parotid at a much higher level than is generally supposed. Duval's technique is based upon exposure of the nerve before it enters the parotid, and following only the fronto-palpebral branch in the posterosuperior angle of the gland.

One incision, commencing at the mastoid, follows the anterior border of the sternomastoid. This is joined by an incision circling the ear and extending along the zygoma. The sternomastoid is divided at its origin, and the carotid artery is ligated above the linqual. The posterior border of the parotid tumor is drawn forwards and the posterior belly of the digastric is divided. In front of the latter the facial trunk is exposed, and the bifurcation seen. The lower branches are readily determined and are sacrificed. The nerve is then readily mobilized. Beneath it lies the deep part of the gland; this portion is drawn to the surface, to be excised with the rest of the parotid. The rest of the operation proceeds along the classical lines. After extirpation of the parotid the divided muscles are reunited.

This procedure has been employed by Duval in two cases. The photograph of one patient shows little damage as the result of the partial division of the nerve.

The Prognosis of Sarcoma of the Testicle. E. H. CODMAN and R. F. SHELDON, Boston. *Boston Medical and Surgical Journal,* February 19, 1914.

Inasmuch as the opinions expressed in text-books regarding the prognosis of malignant tumor of the testicle are vague or conflicting, the authors studied the results in 80 cases occurring in the Massachusetts General Hospital during the past forty years. In 63 cases a pathological examination was made. The end-results could be determined in 64 cases of the entire number. Of these, 39 died from the disease, 13 were living and well, and 12 died from other causes. In the operated cases, there was a mortality of 59.83 per cent. In four of the 64 cases, the testicle was undescended, confirming the belief that undescended testes are more subject to malignant degeneration. Of 33 operated cases that died from the disease, 21 had no sign of metatasis at operation, yet death occurred in all within three years. Only 12 showed metastasis at operation. In 21 cases in which the location of the metastasis was mentioned, 13 were abdominal.

Further Observations on the Use of the High Frequency Spark for the Relief of Prostatic Obstruction in Selected Cases. H. G. BUGBEE, New York. *Medical Record,* February 14, 1914.

Bugbee recommends the high frequency spark, applied through the cystoscope in the manner devised by Beer for intravesical papillomata, for certain cases of prostatic obstruction. He gives a tabulated report of 14 cases, all of whom have either been cured or were greatly relieved. The cases for which he recommends this method of treatment are the following:

1. Small fibrous prostates, which form a hard ring about the vesical neck, not only constricting the internal urethral orifice, but interfering with the function of the internal vesical sphincter muscle. 2. Elevations of the median portion of the gland in the form of a bar, an elevation of the trigone, or more or less distinct median lobe, without general enlargement of the prostate. 3. Irregular prostatic lobes, narrowing the vesical outlet, or nodules of prostate left after incomplete prostatectomy. 4. Enlargement of the prostate of whatever size and form, where open operation is refused or contraindicated by the condition of the patient.

For the technic of application, the reader is referred to the original paper.

Observations Following the Use of Collargol in Pyelography. CECIL W. VEST, Baltimore. *Johns Hopkins Hospital Bulletin,* March, 1914.

Summary.—At operation, collargol has been found in the kidney and perirenal tissues in five of our cases, and in one case in the peritoneal cavity. The kidney and perirenal tissues in these cases were colored dark brown or bluish black and were edematous. The amount of discoloration was noticed in one instance to extend throughout the entire retroperitoneal space of the side injected. In this case a retroperitoneal abscess developed which necessitated a second operation.

The time between the injection and operation varied from one to five days.

Both 10 per cent and 15 per cent solutions were used. No difference in the resulting clinical symptoms was noted.

Pain may be quite severe, lasting for two or three days, and once for ten days.

As shown by the charts, there may be a definite rise in temperature, 102°F. being reported in two cases and 104°F. in another.

While no case of nephritis has been shown to accompany these symptoms, there are definite urinary changes. The examinations have shown white blood cells, red blood cells, with hyaline and granular casts, to be present three days following the injection; casts for nine days; and albumen in two for twenty-four days; while in a third a trace was detected after 118 days.

In three cases where collargol was used, death has followed, but it is not evident that it was precipitated by the collargol.

Collargol should be used only when absolutely necessary.

It should be allowed to run into the renal pelvis in small amounts and under very low pressure.

A freshly prepared solution, not over 15 per cent, should be used.

It is necessary that the symptoms here mentioned be known by those using this method of pyelography, and especial care be exercised to avoid their occurrence.

On account of the results here shown, some other medium must be sought which will give a shadow by not injuring the renal substance. After a more extensive use of silver iodide emulsion, this material may be found to serve well.

Cancer of the Prostate. P. J. FREYER, London. *The Urologic and Cutaneous Review,* February, 1914.

This is a clinical presentation of the subject and does not deal with the pathology of the disease and its development from adenofibroma of the prostate (Albarran, Hallé); 13.4 per cent of 1276 cases of prostatic enlargement were clinically carcinoma. The condition is therefore much commoner than is generally supposed. The symptoms of malignant disease of the prostate resemble those of ordinary prostatic enlargement. It is very important, however, to note that the symptoms run their course rapidly, in a few months, in fact. Carcinoma should be suspected if the symptoms develop in individuals under fifty or over seventy years of age. It is not necessary to enumerate the symptoms of advanced prostatic carcinoma. Freyer insists that hematuria is a symptom of prostatic hypertrophy rather than of carcinoma, except if the latter be very advanced.

The passage of a soft catheter often aids greatly in the diagnosis. In the majority of cases of benign enlargement the coudé catheter easily enters the bladder; in malignant disease the catheter meets with a sudden resistance in the prostatic urethra owing to the dense and unresisting tissue. There may also be pain and a little bleeding as a result. Upon rectal examination the cancerous prostate may present nodules, irregularities, especially the advanced tumors. The most significant feature of malignant disease of the organ is its immobility.

Palliative treatment can alone be practiced for advanced carcinoma. When the growth is yet confined to the interior of the capsule, the results of suprapubic prostatectomy are very good indeed. The details of a number of the cases are presented.

Corynebacterium Hodgkini in Lymphatic Leukemia and Hodgkin's Disease. A. E. STEELE, Boston. *Boston Medical and Surgical Journal,* January 22, 1914.

Steele isolated a diphtheroid organism identical with that first discovered by Negri and Miermet, in one case each of lymphatic leukemia and Hodgkin's disease. Inasmuch as this observation has been confirmed by Bunting and Yates in seven cases of Hodgkin's disease and by Billings and Rosenow in twelve cases of the same malady, the probability that this organism has some definite relation to Hodgkin's disease is rather strong. Billings and Rosenow have suggested a vaccine for purposes of treatment, but thus far no results have been reported.

Two Female Xiphopagi (Deux Fillettes Xiphopages). DR. G. LEFILLIATRE and DR. AUBOURG. Paris, France. *Paris Médical,* February 14, 1914.

The authors give a detailed account of two female children who are united by a bridge of tissue at the level of the xiphoid cartilage. The parents were healthy, the mother being forty-four years of age. Pregnancy was normal and the labor proceeded apparently normally until, after the presentation of the head, all progress stopped. By inserting the hand into the uterus it was found that the fetus was a "monster" and that the second fetus was in a transverse position. A podalic version was performed on the latter and the two children were extracted together, one by the head, the other by the foot. This necessitated a rotation of the bridge of tissue uniting the children, which, however, did not seem to do any harm, for the babies appeared to be quite normal.

The temperatures and blood counts of these two individuals differ. *X*-ray examination shows that the bridge of tissue contains a rod of cartilage, but apparently no vital organs with the exception of the occasional passage of coils of small intestine from one abdominal cavity into the other during deep expiration. This was repeatedly shown by bismuth *x*-ray plates.

The children gained in weight on breast milk, and the authors consider them excellent cases for surgical intervention.

Operative Treatment of Internal Hydrocephalus in Infants. (*Traitement Opératoire de l'Hydrocéphalie Interne chez les Enfants.*) L. M. PUSSEP, St. Petersburg. *Revue de Chirurgie,* December 10, 1913.

The author has practiced his operation in twenty infants suffering from hydrocephalus from various causes. The procedure, in brief, consists in an exposure of the right (generally) parietal lobe through a flap incision. The dura is incised, the ventricle aspirated, and a small silver canula is fixed in the ventricular cavity. The fluid escaping from the canula drains into the subcutaneous space. This procedure has been curative in several cases in which the cause of the hydrocephalus is a benign one (inflammatory closure of one of the exits for the fluid). In no instance did the presence of the canula prove irritating. The operation gives the best results only when general treatment is actively carried out.

Technic of Neosalvarsan Injection Into the Jugular and Scalp Veins of Infants. GERMAIN BLECHMAN, Paris, France. *Paris Médical,* January 31, 1914.

The author gives a precise account of the technic of injecting neosalvarsan intravenously in infants. In an experience of one hundred cases he has had excellent results in using the external jugular veins or the veins of the scalp. No preliminary dissection is necessary, and if one has fine calibred needles with sharp points, as a rule there should be no difficulty in entering the vein. Three assistants are necessary to keep the child perfectly quiet during the injection. Neosalvarsan was used in all the cases. It was given once a week or every two weeks for five to seven injections. The initial dose was at least 1 centigram per kilo; the final dose was 1½ centigram per kilo. However, in children under one year no dose was larger than 2 centigrams, regardless of the weight of the child.

The author claims to have had very little difficulty with the technical part of the drug's administration and believes this to be the method of choice. Only twice did a hematoma from a previous injection interfere with the technic and this was overcome by waiting a few days for its subsidence.

The therapeutic results from neosalvarsan were excellent.

On the Diagnosis of Luxation and Separation of the Meniscus. (*Zur Diagnose der Meniscusluxation und des Meniscusabrisses.*) E. BIRCHER, Aarau. *Zentralblatt für Chirurgie,* November 29, 1913.

The diagnosis of the above mentioned conditions is oftentimes attended by much difficulty, especially if the luxation or separation is of minor degree. Bircher has found that auscultation of the knee during slow passive flexion and extension affords a positive means of diagnosing these conditions. A peculiar rubbing sound is heard on the medial or lateral edge of the meniscus. The sound is more pronounced during flexion than in extension. This sign was confirmed at operation in six or seven cases.

Juvenile Hyperthyroidism. W. H. LEWIS, Rochester, Minn. *The Saint Paul Medical Journal,* February, 1914.

In a period of eight years there have been 1,512 patients operated upon at the Mayo clinic for exophthalmic goiter. Of this number five were under ten years of age (one in three hundred cases). Lewis gives a brief history of each of these five children and discusses the symptomatology of hyperthyroidism in childhood.

In each of these cases there was a firm, noticeably enlarged thyroid apparently hyperplastic to the touch. The following symptoms were noted: vasomotor disturbance of the skin in one, tremor in three, mental irritability in four, tachycardia in five, exophthalmos in five. All the other features observed in the disease in adults participate in the vigorous activities of their associates without apparent cardiac or muscular distress, while none of them even approached the crisis so frequently seen in adults.

A double ligation was performed on three of these patients; in two a portion of the thyroid was resected, one being preceded by a single ligation, all of which operations gave prompt and, up to date, satisfactory results, in contradistinction to adults, most of whom do not seem to be safe without a thyroidectomy. All the patients were girls, their ages ranging from four to eight years.